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ETHER DEATH: A PERSONAL EXPERIENCE IN FOUR CASES OF DEATH FROM ANÆSTHETICS.

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IT has been my fortune on four occasions to witness the occurrence of death during or immediately after the production of anæsthesia. In three of these instances sulphuric ether was employed; in the other, bromide of ethyl. In none of the cases, however, was I the administrator of the anæsthetic, but merely a by-stander or an assistant in the efforts at resuscitation. On numerous other occasions I have seen patients almost die from the effects of chloroform or other anæsthetics, who were fortunately revived by well-directed treatment. These circumstances have been called to mind, many times with considerable anxiety, when resorting to anæsthesia in the performance of surgical operations; and I therefore desire to report in full the case of ether death which recently occurred under my observation. Afterwards I shall refer to the three other cases spoken of, which have been already recorded by myself or others; and finally I shall offer some remarks as to ether deaths in general.

Case I.—Death from Cardiac Failure after Etherization.

The patient, a woman, aged 26 years, was admitted to Dr. R. J. Levis's ward, in the Jefferson College Hospital, with fibrous anchylosis of the right knee and hip, occurring subsequently to arthritis, considered by her physician to be rheumatic in character. The trouble had existed about a year, and Dr. S. L. West, of Wilmington, had treated her also for chronic uterine disease, rheumatism, cardiac palpitation, and nervous prostration.

After she had been in the hospital for two days, she was placed upon the operating-table (on January 20, 1881) for the purpose of having the fibrous joint-adhesions broken up by passive motion. When she was brought into the room she was frightened and very nervous, which was attributed partly to the fact that, before she entered, a very boisterous sailor, just recovering from ether, was removed. She was asked if she had ever taken ether, and replied that she had often done so. I then, as Dr. Levis's assistant, placed my ear to the cardiac region to ascertain the condition of the heart before the resident surgeon began etherization. As I did so, she exclaimed, "I have a bad heart," referring, no doubt, to cardiac symptoms, such as palpitation, which she had experienced. Of these symptoms I had known nothing, and auscultation was begun merely as a precautionary measure. Her remark, therefore, made me listen with more care, perhaps, than I otherwise would have done. The heart's action was rapid and tumultuous, as would be expected from her excited condition, and I thought I detected an indistinct murmur. Nothing sufficient to contra-indicate anæsthesia appeared to be present.

The resident physician (Dr. York) then began to etherize slowly, using Squibb's ether poured on a couple of towels. The patient did not at first breathe very deeply, but in a short time passed into a condition of anæsthesia without the least struggling. Dr. Levis then broke up the adhesions of the hip and knee, using a mallet to loosen the patella, which was quite firmly attached to the condyles. In these manipulations I assisted, being at the foot of the bed, and, hence, away from observation of the patient's respiration and pulse.

Soon the anæsthetic was suspended, and an extension-apparatus of adhesive plaster adjusted to the limb. The time occupied in etherizing, operating, applying the plaster, and removing the patient to the ward was about half an hour (2 P.M. to 2.30 P.M.). There was no vomiting.

After the limb had been placed in position, and just before the woman was taken from the operating-table, while she appeared to be quietly sleeping, I placed my finger upon the right pulse and was astonished at its feebleness and frequency. I immediately called the resident's attention to the fact, and informed the operator of the unfavorable condition of circulation.

We all followed her bed to the ward. She had not awakened up to this time, but was unconscious, and was breathing quietly and regularly. If it had not been for the cardiac depression, nothing would have given the alarm or caused apprehension. The pulse was feeble and beating 180–200 per minute, while the regular, quiet respirations numbered about 22. As the symptoms did not improve, twenty drops of tincture of digitalis with enough whisky to fill the syringe twice (f℥j approximately) were given hypodermically at 2.35 P.M. At 2.42 P.M. an enema of about six fluidounces of whisky was administered, and twelve minutes later (2.54 P.M.) I gave a hypodermic injection of tincture of digitalis (℥x) and sulphate of atropia (gr. $\frac{1}{100}$).

Then the faradic battery, which had been brought to the bedside, was suggested as a remedial agent, but, as the respiration was continuing comparatively unaffected, it was only applied for a short time, with one pole to the neck, the other in the præcordial region. After the hypodermic of digitalis and atropia I thought the pulse became a little stronger, but this observation may have been incorrect. At any rate, in a short time the progressive cardiac failure was so patent that at 3.10 P.M. ten minims of tincture of digitalis were injected by me into the subcutaneous tissue of the breast. Ten minutes later (3.20 P.M.) atropia sulphate (gr. $\frac{1}{60}$) was injected into the mammary region, and an enema of strong hot coffee (f℥viij–x) administered.

Before these remedies were given, cyanosis of the hands was exhibited, and at about the same time respiration became somewhat irregular. The pupils were not dilated.

The patient continued to sink, and at 3.32 P.M., when respiration was almost gone, a final hypodermic injection was given, consisting of atropia, gr. $\frac{1}{60}$; tincture of digitalis, ♏x; whisky, ♏xxx. At 3.35 P.M. the patient died quietly, without having shown signs of consciousness, and, I think I am correct in saying, without voluntary motion of the limbs, from the time anæsthesia was produced.

After death an effort was made to determine the exact quantity of ether given. A new can of Squibb's ether had been opened before etherizing the previous patient, who was a powerful sailor requiring amputation of a finger, and to whom an additional quantity of the anæsthetic was given after he had partially regained consciousness, in order to insert the sutures and dress the wound. It was the noise of this boisterous patient, before he left the operating-room, that increased the alarm of the unfortunate patient who followed him. After the man and the woman had been operated upon, it was found that only six ounces avoirdupois of ether had been removed from the can. It seems fair, then, to estimate the amount taken by the woman, to whom it was not given with as free a hand, at two and a half or three ounces avoirdupois, or about three and a half fluidounces.

I may state also that the quantities of digitalis and atropia were accurately measured by the piston of the hypodermic syringe; but, as is well known, these are frequently marked incorrectly.

The autopsy was made by Dr. Morris Longstreth, the pathologist of the Hospital, twenty-one hours after death.

There was a small amount of pleural, but almost no pericardial, effusion. The heart-cavities contained fluid blood, and neither ventricle was firmly contracted. The right auricle was slightly dilated; the left thickened, and its cavity dilated, especially in the auricular appendage. The right ventricular wall was thickened and the cavity dilated, especially towards the artery. The left ventricle showed no special change. The coronary veins were filled with blood, and two spots of ecchymosis were seen on the surface of the heart. The cardiac muscle was much softened. The valves of the right side were normal, though the auriculo-ventricular orifice was dilated. The mitral leaflets were normal, with the exception of one or two patches of thickening; the orifice, however, was dilated. The aortic valves were competent, and showed no evidence of thickening, though a small fenestra was found in one leaflet. The aortic sinuses seemed pouched. The oval fossa presented an oblique opening large enough to allow the passage of an ordinary wooden lead-pencil.

Some remains of the thymus gland were visible. The lungs crepitated poorly, and were congested posteriorly; anteriorly they were pale in color. No evidence of œdema. Both lower lobes posteriorly were softened, but not granular. Section of the lung-structure showed no other conditions. The spleen presented no special change. No odor of ether was perceptible about the viscera. Left kidney was irregular, moderately firm, and deeply congested, showing, on section, no alteration of cortex, but having an adherent capsule and some subcapsular ecchymoses. The surface was but slightly granular. At several points in the pyramidal portion areas of softening from which drops of mucoid material could be pressed were seen. Right kidney was softened, and presented same condition as noted in left.

Liver had smooth surface, was moderately congested and somewhat softened. On the anterior surface of the right lobe, near the middle, was situated a non-protruding cyst, an inch in diameter, filled with dirty-brown gelatinous material. The interior of this cyst was lined with an opaque, smooth, white membrane. The ovaries showed marked cystic disease; the cyst of the left ovary was as large as a small walnut, and contained blood. A catheter was introduced into the bladder to obtain some urine for analysis, but the bladder was empty.

A marked feature of the examination was the fact that almost every organ presented some noticeable change; but in none were these alterations characteristic of any distinct disease.

Microscopic Examination. — The heart-muscle presented evidences of granular and fatty degeneration; and none of the fibres

showed normal striation. On teasing out the fibres, large numbers of oil-drops were liberated.

The appearances presented by sections of lung-tissues were very similar to those of embolism. The smaller arteries and capillaries were packed with blood-corpuscles and rendered tortuous; yet no embolus of fat or blood could be found. The lung epithelium showed no changes, but the peribronchial connective tissue was increased.

The capsule of the kidneys showed no evidence of thickening. The arteries appeared slightly enlarged and their walls thickened. The capsules of the Malpighian bodies were thicker and firmer than usual, and around them nuclear proliferation had taken place. Within the Malpighian body proliferation was likewise occurring, similar to that seen in glomerulo-nephritis. The intertubular tissue was slightly swollen, and for the most part its nuclei were more distinct and numerous than normal. The convoluted tubes were slightly irregular in outline; their basement membranes appeared unchanged; and their epithelia were swollen, markedly granular, with nuclei in most instances indistinctly visible.

The capsule of the liver was thickened, and showed active proliferation from its under surface into the interlobular connective tissue. In many of the portal canals, in the deeper portions of the organ, the connective-tissue increase was even more marked than noted above. The liver-cells appeared slightly shrunken and highly granular; their nuclei were visible, but stained poorly, and in some instances appeared almost vesicular. None of the cells showed any fatty infiltration, but on the contrary presented appearances of fatty degeneration, as evidenced by numerous small oil-globules. No changes were noticed in the interlobular vessels or ducts.

Case II.—Sudden Death after Administration of Chloral and Etherization, prior to Amputation of the Thigh.

In 1872 I witnessed a death from ether, which occurred under the following circumstances:

A man, aged 35 years, was to be subjected to amputation, for necrosis of the femur accompanied by many sinuses discharging very large amounts of pus. Twenty grains of chloral were administered immediately before the etherization, and a large amount of the anæsthetic was apparently given in a short time. In fact, the ether was pushed. Just as the amputation was to be commenced, collapse occurred and immediate death ensued.* I believe no autopsy was made. As I merely witnessed the fatal issue, I have no means of giving more accurate notes. This was at a time previous to the introduction of the elastic bandage, which was therefore of course not applied to the limb. Hence, embolism, due to forcing pus or clots into the vessels, which suggests itself, is not tenable as the cause of death.

Case III.—Death from Œdema of the Lungs after Anæsthesia by Ether.

The other case of ether death, or rather of death occurring subsequently to, but not immediately after, etherization, of which I have personal knowledge, took place in 1876. The history in brief is as follows:

A youth, aged 19 years, who had marked angular spinal curvature from caries, was admitted by Dr. T. G. Morton into the Pennsylvania Hospital for treatment of an anchylosed right knee. He was anæsthetized with two and a half or three ounces (fluid?) of ether, and subjected to tenotomy and forcible straightening of the limb. The apparatus made for the case was adjusted to the limb, and the patient, by this time conscious, was removed to his private room. He had been under the anæsthetic influence not over twenty minutes, there was no vomiting, no marked evidence of mucus collecting in the trachea or fauces, and he rapidly recovered consciousness when the ether towel was taken from his face. Fifteen minutes after removal to his room he showed alarming symptoms of asphyxia, such as cyanosis and impending cessation of respiratory motion. Dr. W. B. Hopkins and I endeavored to relieve him by depressing the tongue and dashing cold water in his face, which, however, only produced violent respiratory efforts. As the condition grew worse, and frothy, blood-stained mucus expelled from the fauces gave evidence of pulmonary engorgement, which was accompanied by labored cardiac action, we applied dry cups to the chest and drew about eight fluidounces of blood from the radial artery. Respiration and circulation seemed to improve somewhat from these measures; but he continued to sink, despite the subcutaneous injection of carbonate of ammonia and whisky, and died one and three-quarter hours after anæsthesia. Dr. Hopkins had seen that he had perfectly recovered from the anæsthetic sleep before removal from the operating-room, and even during the stage of asphxyia the patient was quite rational.†

* See Morton's Report on Ether Deaths, in American Journal of the Medical Sciences, October, 1876, p. 415.

† For a more complete account see Dr. Morton's paper in Amer. Jour. Med. Sci., October, 1876, p. 411.

The autopsy showed a deformed thorax, due to the antecedent vertebral caries, old pleural adhesions between the lung and parietes, and the lower part of the right pleural cavity obliterated by firm adhesions between the diaphragm and costal pleura. The pleural cavities showed much serum infiltrating the meshes between the adhesions; and the lungs, pitting on pressure, exuded on section large amounts of frothy fluid, as from a saturated sponge. The lung-tissue was fairly crepitant, and floated in water. The heart-cavities contained fluid blood, while the valves and muscular tissue were normal. The great vessels at the base of the heart were healthy. No foreign body was found in the trachea or large bronchi. The kidneys were not examined.

Dr. Morton considered this patient to have died from "the mucous secretion and serous effusion which invaded every available space, thus suffocating the patient." This fatal pulmonary œdema was of course due to the inhalation of ether, since the patient was in good health when subjected to operation.

The fourth death from anæsthetics which I have seen has already been reported by me,* and occurred during the administration of bromide of ethyl. A short account of the circumstances, however, may be allowable at this time.

Case IV.—Death occurring during the Use of Bromide of Ethyl as an Anæsthetic.

A boy of 18 years was received into Dr. R. J. Levis's ward of the Jefferson College Hospital for lithotomy. He was in bad condition, and the operation was therefore delayed until tonics and corroborative treatment could be employed in the endeavor to improve his general health. Finally, upon the approach of summer weather, after several weeks' stay in the ward, he was placed upon the operating-table. He was given some whisky and fifteen grains of quinine on account of his debility, and the inhalation of bromide of ethyl begun. He was exceedingly nervous and agitated before he commenced inspiring the anæsthetic, and struggled a good deal during its administration. Four fluidrachms of bromide of ethyl had been poured on the towel in divided quantities, when the cutaneous incision was made. Just then it was noticed that respiration was imperfect, and the towel was removed from his face. The lips were pinkish, and no marked cyanosis was noticed. As I was holding the lithotomy staff, I am unable to say what was the condition of the pulse; and the observation of the administrator of the anæsthetic is not recorded. A few feeble inspiratory efforts took place, but inversion of the patient, nitrite of amyl inhalation, artificial respiration, galvanism, and drawing forward the tongue were of no avail. The pinkish lips would perhaps point to death from syncope, but the respiratory symptoms were the first to attract attention. It may be that the pulse failed a moment previously. The autopsy showed a slight odor of the bromide of ethyl emanating from the thoracic and abdominal cavities; old pleuritic adhesions; areas of consolidated lung, containing cavities, due to catarrhal pneumonia; some dilatation of the heart, and kidney changes. The microscope showed the beginning of renal inflammation, and discovered such atrophic alterations of the heart-fibres as are often present in connection with advanced lung disease; but there was no fatty degeneration of the cardiac muscle.

Such, then, are the clinical features of the four cases of death from anæsthesia which I have witnessed. Though the pathological features of these cases and the physiological actions of ether and other anæsthetic agents could be much better discussed by other members of the Society than myself, I desire to make some general remarks on the subject of ether death. First, as to the case that forms the text of my paper. Was she a proper subject for etherization? was the anæsthetic given properly? was the after-treatment properly conducted? how did ether kill her? are questions that we must study thoughtfully, and which I offer for thorough discussion and criticism by the members of this Society.

Was she a proper subject for etherization? The patient's heart was ausculted immediately previous to the administration, and nothing found to contra-indicate ether. Indeed, even if marked organic disease be detected in patients about to be anæsthetized, it is not regarded as an absolute bar to the administration. Ether is frequently given to such patients, and J. W. Haward, in advocating the superiority of ether to chloroform, states that he has given chloroform to persons with extensive heart disease.† Kappeler and Reeve reject‡ the idea that fatty degeneration of the heart is an important factor in chloroform deaths; and it would be expected to be a much less important factor in ether death. Hence, even if valvular disease or fatty degeneration had been discovered, it would not have precluded the administration. Dila-

* Philadelphia Medical Times, July 17, 1880, p. 521.

† Medico-Chirurgical Transactions, 1872, p. 8.
‡ American Journal of the Medical Sciences, July, 1880, pp. 201, 202.

tation of the heart is probably a more dangerous condition than any other when anæsthetics are to be administered. The woman had been etherized twice previously, and, according to her husband, by a much larger amount of ether than given on the fatal occasion. Her physician, Dr. S. L. West, tells me that he etherized her on the last occasion, which was fifteen months ago, without any unpleasant effects; but I am not sure that this was previous to her rheumatic attacks. Since her death he has written to me that she had shown cardiac and renal symptoms while under his care, but that he had examined the urine twice without discovering albumen or sugar. As we had auscultated her heart and found no special lesion, as her physician had discovered no albuminuria, and as she had taken ether twice previously without trouble, she *was* a proper case for etherization. It was negligent, however, in us at the time of operation not to inquire into the condition of the kidneys; for then we did not know of Dr. West's negative analysis. Hundreds of patients are etherized every year without a urinary analysis being made; among whom some certainly have Bright's disease. Although the discovery of albuminuria would not have deterred us, as the operation could not have been performed without it, still, as it is well known that renal disease prevents the ready elimination of the anæsthetic, every surgeon should take the preliminary precaution of examining the urine at least in cases of chronic disease.

Was the ether properly given? The amount used was small, it was given, sprinkled upon two towels, by a resident who was accustomed to using ether, it was of Squibb's manufacture, and produced during the inhalation nothing to attract the administrator's attention. Hence it may be assumed that this question can be answered affirmatively.

It seems, indeed, that ether could hardly have been administered to any patient and under any circumstances better calculated to dispel anxiety. There was no special heart-lesion observed, there had been no albuminuria, there was no cutting operation to cause shock, the quantity of ether was small and of the best quality. Yet she died.

Was the treatment of the patient after dangerous symptoms occurred conducted properly? I think we may say that it was. The only indication of danger observed was the rapid and feeble pulse; the respiration was not bad, and the unconsciousness appeared to be merely such as is often seen after full anæsthesia. In fact, one gentleman remarked that she merely seemed to be sleeping off the anæsthetic. The indication for treatment then seemed to be cardiac stimulation, which was attempted by digitalis and whisky. The main reliance was upon the former, for the enema of whisky (f℥vj), though comparatively large, would not be absorbed very rapidly; and the spirit given hypodermically was in small amounts and at considerable intervals. It is well known that belladonna is claimed as advantageous in shock and in respiratory failure: hence the atropia given was not inappropriate, although respiration was good and not irregular until near the fatal termination. Morphia was suggested, but the comatose condition of the patient seemed to me to contra-indicate its use. Nitrite of amyl and the battery, which was indeed used for a short time, were, I believe, appropriately rejected. Is it possible that hot-air baths would be available in such conditions by causing cutaneous elimination of the anæsthetic? I know nothing clinically on this point, which I merely throw out as a suggestion.

How did ether produce death in this instance? The recent report to the Scientific Grants Committee of the British Medical Association* states that the chief dangers in anæsthesia are—1, sudden stoppage of the heart; 2, reduction of blood-pressure; 3, alteration of the pulse-respiration ratio; and, 4, sudden cessation of respiration. The danger from ether, it is said by the same report, approaches from the pulmonary rather than from the cardiac side. I believe that, as a rule, danger from ether is shown by the respiration, and I always in etherizing have watched the respiration with more care than the pulse; but this custom, which is general among surgeons, I now feel is founded upon error. The patient whose case I am studying did not present any special respiratory symptoms until more than a half-hour had elapsed from the time that the circulatory symptoms presaged imminent death. She was evidently dying long before respiration showed any sign of her danger. The

* British Medical Journal, December 18, 1880, p. 971.

pulse-respiration ratio was greatly altered, for with a feeble pulse beating 180–200 per minute the respirations were very little above normal. It was this rapid feeble pulse that struck me with astonishment, when every other clinical appearance seemed to indicate safety.

We have become too much inclined to look upon ether as having no depressing effect on the heart. If we examine clinical evidence and that deduced from experiment, we shall find that ether does at times depress the heart, but much less actively than chloroform. The Committee of the Royal Medical and Chirurgical Society stated in 1864 that ether exerts but a very slight depressing influence on the force of the heart's action.* This authoritative statement of the slightly depressant effect of ether on the heart, which has been reaffirmed and repeatedly proved, has led us to look upon it as almost an impossible thing for ether death to occur from cardiac failure. Many readers perhaps have neglected to continue the perusal of the above report to the modified statement that "ether destroys life partly by enfeebling the action of the heart, but chiefly by arresting the movements of respiration."†

Kappeler says it is by no means apparent that ether death in human beings always begins by disturbance of respiration, and proceeds from the respiratory system.‡ Dr. J. C. Reeve believes it to be an error to think that there is a difference in regard to the actions of chloroform and of ether upon the nervous centres of respiration and circulation,§ and says that Kappeler reports three instances of sudden cardiac death from ether. In speaking of the comparative safety of ether, ethidene dichloride, and chloroform, the report to the British Medical Association asserts that the circulation is more readily established when its cessation is due to ether, than to the two other anæsthetic agents ;‖ which statement infers that ether may produce dangerous cardiac depression.

This evidence all tends to show that surgeons lay too much stress on the respiratory action of ether, and perhaps administer it carelessly because they feel that respiration is easily watched during anæsthesia, and that artificial respiration can immediately be instituted. Some writers have attributed perfect safety to ether, and have even gone so far as to state that if complicated instruments are avoided and nothing but the towel and sponge used there is absolutely no danger.¶

All this is wrong. Every man should feel that anæsthesia, which places many of the animal functions in abeyance, is akin to death, which is merely the additional obliteration of circulation and respiration. All anæsthesia is dangerous, though the degree varies with the agent.

There is certainly no doubt that death in the instance before us was due to ether given to a patient not specially obnoxious to the agent, and given in the usual manner; and that death resulted directly from cardiac depression without respiratory symptoms.

In glancing over the four cases presented for your consideration, I may make the following summary. The woman (Case I.), whose death I have been discussing, certainly died because of the influence of ether upon the heart; the man (Case II.), whose sudden collapse occurred after the ether had been pushed, possibly succumbed to its cardiac depression also, though the notes are not sufficient for an accurate determination; the young man's death (Case III.) was due to œdema of the lungs resulting secondarily from etherization; while the bromide of ethyl case (Case IV.) presents a history pointing to cardiac paralysis as the cause of the fatal issue. In the first two and the last case death was primary, because the patients never awoke from the anæsthetic sleep; in the third it was secondary, because the asphyxia due to pulmonary œdema supervened after consciousness had returned.

How are ether deaths to be avoided? This is, after all, the question of paramount importance, that forces itself upon every one. It has been suggested by Dawson of Leeds** that the fatal effects of ether are due to the pulmonary circulation being impeded by capillary contraction caused by the cold produced by the ether. Then embarrassment of the right heart occurs because of the unusual resistance it has to

* Medico-Chirurgical Transactions, 1864, pp. 333, 334.
† Ibid., p. 351.
‡ See Review in Amer. Jour. of Med. Sci., July, 1880, p. 209.
§ Cincinnati Lancet and Clinic, October 30, 1880, pp. 387, 388.
‖ British Medical Journal, December 18, 1880, p. 971.
¶ Jonathan Hutchinson, British Med. Jour., November 6, 1880, p. 760.
** British Medical Journal, March 2, 1878, p. 289.

overcome. These and other theories belong to physiology rather than to clinical surgery; and I shall not stop to discuss them. It would seem that death from ether anæsthesia may occur at times when there is no reason in the patient, or in the method of administration, to expect such a result. It is imperative upon us all, however, to take every precaution to avoid such an occurrence; and yet I am convinced that no powerful drugs are administered as carelessly, as recklessly, and by as incompetant hands as anæsthetics. Let every one remember that an anæsthetized patient is really a patient with one foot in the grave, and he will feel the responsibility that rests upon him when he gives an anæsthetic. Lungs, heart, and urine should always be examined before the administration, for, though lesions here should not preclude anæsthesia when necessary, the knowledge of such lesions would enforce caution and care. I have seen persons profoundly anæsthetized without the least examination or inquiry having been made as to these organs. I have seen them left by the physician before they had regained perfect consciousness. I have seen ether given by persons who knew nothing of its dangers or the methods of averting evil results. Every member of this Society, including myself, has probably been guilty of these things; and yet we are astonished when a patient dies from ether. The wonder really is that ether deaths are not more frequent than they are.

Anæsthesia is partial death, and one step further is death. Hence the man intrusted with the ether towel at an operation should be the most skilful of all the assistants. In many instances more skill is required in the administration of the anæsthetic than in the performance of the operation. Yet this duty is generally relegated in hospitals to the junior residents, and in private practice often to the nurse or a layman. It would be useless and improper for me to attempt to instruct this body in the method of giving anæsthetics, for you all have given them frequently. The only point I desire to enforce upon your attention is, "Take care. All anæsthesia is dangerous." Ether anæsthesia is less so than chloroform anæsthesia; and hence I believe, as I have elsewhere written,* that chloroform should be rejected entirely as an anæsthetic in practical surgery. If anything safer than ether is found, we must reject ether.

Anæsthesia is undoubtedly essential in surgery, medicine, and midwifery, and is properly resorted to in cases of cardiac, pulmonary, and renal disease when necessity demands it. In many cases the risk without it would be greater than the risk with it; but it should be regarded as a powerful agent for evil as for good. Unfortunately, we have, as yet, no infallible means of predetermining which cases will be instances of death from anæsthesia.

A report of all the ether deaths that have occurred in the last few years would be a valuable aid in studying the fatal action of the agent, and I have therefore appended to this paper a list of those that I have found recorded since January, 1872.

In the *British Medical Journal* for March 2, 1878, pp. 290, 291, Mr. Cawtley Dawson gives the histories of eighteen cases of so-called deaths from ether, occurring during the years 1873, '74, '75, '76, '77. In this list, however, he records some cases which should not properly be claimed as deaths from ether. He eliminates nine, and accepts the remaining nine cases, in which he thinks ether was the cause of death. Of these he gives a tabulated statement. Among the number rejected by him is the case reported by me (Case III.) as a death from œdema of the lungs after ether. He also rejects the case marked No. 14 in his list, for a similar reason,—namely, that death was caused by previous pulmonary trouble aggravated by ether. These should certainly be regarded as deaths resulting from etherization. His case No. 13 was that of a patient in whom cerebral hemorrhage was found after death. This appears from the short account to have been caused by the etherization, and should not be rejected. These three cases, added to the nine which he accepts, would make twelve instances of ether death; but I reject his accepted case No. 16, because chloroform was mixed with the ether, and the woman died one minute after the beginning of inhalation, possibly from the small amount of chloroform in the mixture.

Hence I have from him eleven cases of primary and secondary ether death, of which No. 1 is Case III. of my present paper. To these the two other ether cases in this paper may be added, making thirteen cases in all.

Continuing my search, I have found reported during 1878, 1879, 1880, seven other cases.

I. *British Medical Journal*, May 18, 1878, p. 730. Man, aged 50 years; strangulated hernia for four days; London Hospital. Ether,

* Transactions of the Medical Society of the State of Pennsylvania, 1880, pp. 152, 153.

1½ ounce, given for examination of hernia; respiration ceased, and pulse beat for one and a half minutes afterwards. Left ventricle contracted; heart apparently healthy; lungs extremely congested; kidneys slightly granular, but not congested; commencing peritonitis.

II. Turnbull's *Artificial Anæsthesia*, 2d ed., p. 47. Mr. G. W. Callender, surgeon to St. Bartholomew's Hospital, London, told author of a case occurring in that hospital before his visit to America. Patient was admitted for intestinal trouble. This may be the same case as No. III. below.

III. *London Lancet*, Am. ed., Nov. 1880, p. 420. Reported by R. N. Hartley; operator, Mr. Teale. Man, aged 66 years; intestinal obstruction; ether by Clover's small inhaler, a little over one ounce. After fifteen minutes, while surgeon was operating for colotomy, the man vomited, took a deep inspiration, then appeared about to vomit again, but sank on pillow and died; pulse was good when he first vomited. This seems to be a death from interference with respiratory action.

This may be the same case as that mentioned above by Turnbull.

IV. *British Med. Jour.*, April 12, 1879, p. 562. Girl, 8 years; strabismus; Moorfields Royal Ophthalmic Hospital. Ether and a little chloroform; discharged two or three hours after operation, and removed to home by mother; died collapsed about seven hours after operation. No autopsy given. Not established as a true ether death.

V. *British Med. Jour.*, February 7, 1880, p. 215; from *Boston Med. and Surg. Jour.* for January, 1880. Man, 55 years; hip-injury; ether for diagnosis; in Providence; respiration stopped after fifteen minutes of inhalation. Serum beneath arachnoid, valvular disease of heart, cystic degeneration of kidneys.

VI. *British Med. Jour.*, February 7, 1880, p. 215; from *Canada Lancet.* Lady; extraction of teeth; scarcely one ounce used; death from paralysis of the heart.

VII. *Cincinnati Lancet and Clinic*, October 30, 1880, p. 380. Dr. N. P. Dandridge's case. Woman, 43 years; necrosis of femur; had been etherized twice, only a short time before, for same disease in same hospital; operation begun, when it was noticed that there was no respiratory motion and no pulse; reacted slightly, but died in about two and a half hours. Lungs healthy, except a few emphysematous blebs; heart-muscle and valves apparently normal; kidneys showed no structural change, but were anæmic.

Of these seven cases, Nos. II. and III. are probably the same, and No. IV. is not a pure ether death, because chloroform was also given: hence we have really but five cases properly attributed to ether. These five, added to the thirteen cases mentioned previously, give eighteen cases of death, fairly attributed to the effects of ether, that have occurred between the years 1873 and 1880 inclusive.

Kappeler, in his article on Anæsthetics in Billroth and Luecke's "German Surgery,"* gives thirteen fatal cases occurring subsequent to 1872;† but I am unable at present to refer to the original work, and cannot compare the cases with Dawson's and my own list.

In *British Med. Jour.*, December 18, 1880, p. 997, Mr. Burton and Dr. Jacob give eleven cases of death occurring during and after administration of ether in Great Britain and Ireland from 1870 to 1880. These correspond in many instances, of course, with Dawson's list.

BIBLIOGRAPHY.

J. Warrington Haward. On Ether and Chloroform as Anæsthetics. *Medico-Chirurgical Transactions*, vol. lv., 1872, p. 5.

Report of Committee of Royal Medical and Chirurgical Society, on uses and physiological, therapeutical, and toxical effects of chloroform. *Medico-Chirurgical Transactions*, vol. xlvii., 1864, p. 323. (Gives effects, etc., of ether also.)

Cawtley Dawson. Deaths from ether. *British Medical Journal*, March 2, 1878, p. 289.

Report on the Action of Anæsthetics to the Scientific Grants Committee of the British Medical Association. *British Medical Journal*, December 18, 1880, p. 957.

Robert N. Hartley. Case of sudden death during ether administration. *Lancet*, American edition, November, 1880, p. 420.

Robert Saundby. Administration of anæsthetics. *Lancet*, November 20, 1880, p. 810.

Joseph Mills. On watching the pulse during the administration of chloroform (criticism of Saundby's paper). *Lancet*, December 4, 1880, p. 912.

N. P. Dandridge. Death from the effects of ether. *Cincinnati Lancet and Clinic*, October 30, 1880, p. 380.

Cincinnati Medical Society. Discussion on Dandridge's paper. *Id.*, p. 385.

Report of Committee of Boston Society for Medical Improvement, on alleged dangers which accompany the inhalation of sulphuric ether. Published by David Clapp, Boston, 1861. (From Turnbull's *Anæsthesia.*)

Dr. J. C. Reeve. Anæsthetics: their position and prospects. *American Journal of the Medical Sciences*, July, 1880, p. 193.

Laurence Turnbull. Advantages and Accidents of Artificial Anæsthesia. Second edition. Philadelphia, 1879.

* Stuttgart, 1880.

† American Journal of the Medical Sciences, July, 1880, p. 208.

ETHYLENE BICHLORIDE AS AN ANÆSTHETIC AGENT; WITH A CONSIDERATION OF ETHYLENE METHYLETHYLATE, ETHYLENE ETHYLATE, ETHYL NITRATE, AND ETHYLIDENE BICHLORIDE.

BY EDWARD T. REICHERT, M.D.

(Continued from page 522.)

THE Effect on the Arterial Pressure.—When the ethylene is given by inhalation and by the modes already described, the arterial tension is but little affected during the first few minutes, unless the vapor be given in a very concentrated condition (Exp. X., XII., and XIII.), and then there is a very rapid decline, equalling nearly one-third of the normal, which is followed by a rise of half this amount, and then by a subsequent fall. In experiments where the air was heavily laden with the vapor (Exp. XIII.) essentially the same result occurred, but in the others, where the vapor was given more diluted, the fall of pressure is not nearly so marked, and the subsequent rise may nearly reach or even go above the normal. In Exp. XI., XII., and XIII. the animals were curarized to obviate any complications of the respirations, and the artificial respiratory apparatus, of course, employed. In Exp. X. the cone was kept almost saturated with the ethylene, and in Exp. XII. and XIII. sponges were placed in the bottom of the bottle, which were kept continually moistened with the liquid, and the air being driven through them, thus necessitating the absorption of considerable of the anæsthetic by the current of air.

Exp. X.—Rabbit.

Time. M. Sec.	Pressure. Mm.	Remarks.
1.	56	
		Commenced inhalation from a cone, which was kept wet throughout the experiment.
.07	52	
.32	39	
.42	32	
2.07	42	
.27	46	Respirations almost imperceptible.
.47	42	
3.07	40	
.27	46	
.47	45	
4.07	45	
.27	44	
.47	41	
5.07	41	

Time. M. Sec.	Pulse in ten sec.	Remarks.
5.47	45	
6.07	44	
.47	40	
7.07	42	Added more ethylene to inhaler.
10.20	42	
11.20	42	
.55		Added more ethylene to inhaler.
12.15	41	
.55	39	
13.40	38	
17.	37	
20.	36	
.30		Added more ethylene to inhaler.
21.	33	
23.	31	
24.	31	
25.	28	
26.	28	
27.25	27	No pulse-curves are distinguishable on the tracing.

Exp. XI.—Rabbit.

Time. M. Sec.	Pressure. Mm.	Remarks.
		Animal curarized.
1.	66	
		Commenced inhalation by means of the Woulfe bottle, in the bottom of which was placed about a drachm of ethylene.
.12	64	
.20	64	
2.20	63	
.40	63	
3.	61	
.20	61	
4.	61	
.40	56	Animal completely anæsthetized.
6.40	56	
7.	60	
.40	60	
8.	62	
.40		Dropped thirty minims ethylene in bottle.
9.	58	
.20	60	
11.20	56	
.30		Dropped thirty minims ethylene in bottle.
.40	57	
12.	58	
.10		Dropped thirty minims ethylene in bottle.
.40	53	
13.	48	
.10		Dropped thirty minims ethylene in bottle.
.20	47	
.40	51	
14.	45	

Exp. XII.—Rabbit.

Time. M. Sec.	Pressure. Mm.	Remarks.
1.	45	
.05		Commenced inhalation, using the Woulfe bottle as before.
.25	44	
.45	46	
2.05	37	
.25	31	
.45	43	
3.05	45	Animal completely anæsthetized.
.25	46	
.45	47	
4.05	53	
.25	50	
.45	45	
5.05	41	
.25	40	
.45	37	
6.05	33	
.45	31	
7.45	31	
9.45	30	
10.05	29	Added ethylene.
.45	29	
11.25	28	Added ethylene.
12.05	26	
.25	23	
.45	22	
13.45	20	
14.25	18	
15.05	17	
.45	15	No pulse.

Exp. XIII.—Rabbit.

Time. M. Sec.	Pressure. Mm.	Remarks.
1.	54	
.10		Woulfe bottle used in which sponges were placed wet with the ethylene.
.20	54	
.45	52	
2.40	48	
3.20	44	
.40	48	Added more ethylene.
4.	48	
.40	49	
5.	47	
.20	44	
.40	50	
6.	52	
.20	48	
.40	48	
7.	44	
.20	31	
8.	25	
.40	32	
9.	32	
.20	25	
10.	19	
.40	17	
.	15	

From these results it will be seen that the most pronounced effect of the ethylene on the blood-pressure when given by continuous inhalation, whether in a dilute or concentrated form, is to produce a diminution to zero, but which is transiently interrupted by a rise towards the normal, which is various in extent and may go even above it (Exp. XII.). As these changes in the pressure occur in curarized animals, any effect which altered respirations or muscular movements might have is obviated by this toxic condition; but as this diminution of pressure is accompanied by a frequent pulse and diminished pulse-curves, which latter has already been pointed out to be due to a depressed condition of the cardiac power, it is at once indicated that the fall of pressure is cardiac in its origin. However, several experiments made on animals with cut pneumogastrics gave results identical with those already recorded on normal animals. It therefore remained but to show whether the heart or vaso-motor system (or both) was the cause of the above results. Consequently, the heart being the most probable agency, experiments were made on animals in which the pneumogastric nerves and the cervical spinal cord were cut, which would necessarily sever all nervous connection with the heart, and whatever results would then follow would evidently be due to a direct cardiac action or to one on the peripheral vaso-motor mechanism.

Exp. XIV.—Rabbit.

Time. M. Sec.	Pressure. Mm.	Remarks.
1.	21	Cut the pneumogastrics and cervical spinal cord.
.05		Inhalation by Woulfe bottle.
.15	19	
.25	21	
.45	17	
2.05	18	
.25	17	
.45	15	
3.05	14	
.25	13	
.45	12	
4.45	12	
5.25	12	No pulse traced.

The fall of pressure still occurring, the following experiment was made to determine if the vaso-motor peripheries were concerned, and, in order to accomplish this object, the pneumogastric nerves and cervical spinal cord were severed and the

thoracic aorta ligated, this latter operation cutting off communication of the blood with the major part of the vascular capillaries, and practically (for our purposes) annihilating the vaso-motor peripheries, while the section of the cord practically destroys the vaso-motor centres.

Exp. XV.

Time. M. Sec.	Pressure. Mm.	Remarks.
1.	53	Cut cord in upper cervical region; cut vagi and ligated thoracic aorta.
.05		Inhalation by Woulfe bottle.
.15	55	
.25	48	
.35	34	
.45	28	
2.05	23	
.25	25	
.45	24	
3.05	21	
.25	20	
.45	18	
4.25	16	
.45	15	
5.05	14	
6.25	13	
7.25	12	
8.25	11	
9.	10	
10.	8	No pulse traced.

The fall of pressure being still as marked in this last experiment, it must be concluded that the depression of the cardiac power is the cause of it, and, in further corroboration of this, it has been found that in animals whose thoracic cavity was opened the direct application of the ethylene to the heart caused its slowing or immediate arrest, and, further, that in animals slowly poisoned an autopsy revealed the heart arrested in diastole. It is probable, though, that the transient rise of pressure which interrupts the fall in normal animals is vaso-motor and both centric and peripheral in its origin, because it did not occur in either of the last two experiments; yet it was well marked in an experiment made on an animal with a cut cervical cord which has not been recorded in this paper.

In looking over the above series of experiments it is interesting to note that, although the drug is a direct and decided cardiac depressant, this organ is capable of bearing a considerable amount of depression before its complete paralysis, and, as was stated early in the paper, the respirations are always the first to succumb, and death is caused in this way. And it was further found that if after the complete cessation of the respirations the artificial respiration-apparatus was attached and air laden with the ethylene vapor driven into the lungs the heart would still continue to pulsate for some minutes. After the blood-pressure had fallen almost to zero and the heart-beats could no longer be traced on the drum, yet when the thorax was opened the organ was still feebly pulsating, and continued so for several minutes. This fact is certainly an interesting one to remember, for in case of accident during its use the absence of pulsations at the wrist would not be so serious as it otherwise would, and by reference to the text immediately following Exp. IV. the invaluable services to be expected from the amyl nitrite cannot be overestimated. And in those cases where a sudden arrest of the respiratory movements occurs, the same good services can be expected, for it is evident, from the results of some of the preceding experiments, that the ethylene acts primarily as an excitant and secondarily as a depressant to the respiratory centres. That the respiratory movements must be arrested by centric paralysis is evident from the results of the experiment just quoted, for if it were due to a paralysis of the respiratory muscles, or of the nervous communication failing to convey the impulses from the centres, scarcely such a rapid recovery of full, regular, almost normal respirations could occur, since the nitrite acts as a depressant to both the motor portions of the cord and nerves and voluntary muscles. Yet the recovered respirations could be attributed to some extent, probably, to a greater supply of blood to the anæmic respiratory centres, for the reason that the increased force and frequency of the heart must have been the cause of driving considerably more blood through the centres, even if the blood-pressure was not increased and the respiratory centres were thus also indirectly stimulated by the nitrite. It is very evident that in the nitrites we have both respiratory and cardiac stimulants, and therefore a double physiological antidote, by acting similarly upon the depressed heart and respiratory centres; and the importance of this knowledge cannot be too deeply impressed on the minds of those who will hereafter make use of this preparation.

As an anæsthetic for general surgical use it is undoubtedly superior to any yet introduced, with the exception of its isomeric compound ethylidene chloride and ether, and is inferior to the latter in but the single point regarding the relative degree of safety; and, while it in all probability is equal to chloroform in strength, promptness, and permanency of effects, it is fully as much superior to it in the point of safety as it is inferior to ether. This last is very evident by referring to the records of the experiments made on the arterial pressure, where it will be seen that the diminution of the arterial tension is that of a gradual decline, decidedly unlike that caused by the slow administration of chloroform, because of the absence of those wide and remarkable variations which occur, especially before complete anæsthetization. Also, when the vapor is given in a state of concentration by saturating a muslin cone with the liquid and placing it directly over the tracheal tube, as in Exp. X., although we have a decided fall of pressure, yet it does not immediately decline to zero, but consumes twenty-seven minutes in reaching within as many millimetres of it. Now let us turn to a similar experiment made with chloroform, and the difference in the results is strikingly great:

Exp. XVI.—Rabbit.

Time. M. Sec.	Pressure. Mm.	Remarks.
1.	59	
		Gave thirty minims of chloroform by inhalation from a muslin cone held over the tracheal tube.
.10	58	
.20	57	
.30	52	
.45	48	
.50	34	
2.00	18	
.10	12	No pulse.

The diverse and interesting results of these parallel experiments are so valuable as scarcely to be overestimated in a comparison of the relative safety of the two compounds, as the pulse in the ethylene experiment could be detected on the tracing for over twenty-five minutes, notwithstanding that the animal was continuously inhaling the vapor during the whole of this time, while in the chloroform experiment but a single dose was placed on the inhaler, the pulse-curves rapidly diminished in size, and the pressure fell to twelve millimetres in a little over two minutes, and the pulse was extinct.

It needs no further argument to prove that this article (or, probably, ethydene chloride) should replace chloroform in such cases where ether cannot be used; but, as it is inflammable, care must be exercised in its use at night, and, as it is a cardiac and respiratory depressant (in toxic amounts), the same cautions should be observed in its use, and never should it be employed, if possible, without amyl nitrite at hand.

Before concluding, I take pleasure in expressing my indebtedness to Mr. Edward Hance (of the firm of Hance Brothers & White, manufacturing chemists, Philadelphia) for the presentation of this valuable ether for the purpose to which it was devoted. It is almost unnecessary to state that particular care was exercised in the manufacture of this specimen to have it pure.

Ethylene Ethylate and *Ethylene Methylethylate* were experimented with, and, although each of them possessed some slight anæsthetic powers, they were so feeble in this respect and caused such distress in breathing that they were abandoned as useless.

Ethyl Nitrate was used by Simpson,* who found it easy and pleasant to inhale, and to possess very rapid and powerful anæsthetic properties, and that small quantities, such as fifty or sixty drops, sprinkled on a handkerchief produced insensibility after a few inspirations. Shortly after, Nunnelly† stated that it possessed not much, if any, anæsthetic power; and my own experiments confirm this, as the following result will show:

"*Rabbit.*—Time, 12.32. Added one drachm to inhaler; .32½, struggles; .33, breathing deeper and slightly faster; .34, no change; .35, added a second drachm to inhaler; .35½, respirations again temporarily increased; .37½, orbital reflexes slightly diminished (?); .39, added a third drachm to inhaler; .40, respirations increased; .43, animal not anæsthetized, but somewhat drowsy, and, although the inhalation was continued for several minutes, no anæsthesia was produced."

Ethidene Dichloride, Ethylidene Dichloride, or *Ethylidene Bichloride* ($C_2H_4Cl_2$),

* Edinburgh Medical Journal, 1848, p. 741.
† Proceedings of the Provincial Medical and Surgical Association, 1849.

which is isomeric with the ethylene bichloride, has of late attracted attention through the researches of the British Anæsthetic Committee,* who found that the exposed heart of the frog, in a glass jar containing an atmosphere impregnated with this vapor, continued beating slowly and regularly throughout the experiment, which lasted, in several cases, for twenty and twenty-six minutes respectively, although the animals were anæsthetized in from four to five minutes. In rabbits in which the thorax was opened and artificial respiration maintained, the cardiac contractions continued vigorous throughout the observations, which continued, in one instance, for forty minutes. Dogs were anæsthetized in from two to three minutes, and were kept fully anæsthetized for half an hour without the slightest failure of the respiration or heart. In experiments with the thorax opened and heart exposed (artificial respiration being kept up) no failure of the heart's action was observed, although the air passing into the lungs was saturated with the vapor. They further state that, practically, the animal can live for a prolonged period in a state of complete anæsthesia under the influence of the ethidene dichloride, while it dies in a short time under chloroform. And in six cases in which it was used† they concluded that no injurious effects on the respiratory mechanism occur; that the pulse is lowered in frequency, but increased in volume, and in the deepest anæsthesia it was steady, regular, full, and compressible; that no failure of cardiac action was present, as they were led to anticipate in their experiments on animals; that there was never blueness of the lips or pallor of the countenance; and, lastly, that the anæsthetic "*presents all the advantages of ether without any of its disadvantages.*" In a more recent contribution‡ it is asserted that the *arterial pressure gradually but slowly fell*, and under repeated doses reached a minimum of twenty millimetres, and after prolonged and constant use was gradually brought down to seven millimetres.

Binz§ used it in six experiments on man, and to his satisfaction, and found that when the patients were fully anæsthetized the breathing became spasmodic and shallow, the pulse lowered, but fuller and more compressible, and all of them presented the appearance of a strong cardiac stimulant. In two cases there was a rise in the pulse-rate, followed by a fall, and in a third case the pulse fell from ninety to eighty. The doses used varied from a drachm to a drachm and a half. More recently Reeve‖ has experimented with it, and his results "show a diminution of arterial pressure, not as occurs when chloroform is used, but, unlike it, it does not advance to complete extinction, nor are there such wide variations in effects at different times in the same animal as in the case of chloroform. . . . Snow believes that it will not be liable to cause sudden death, as chloroform sometimes does. In sixteen cases it did not cause nausea or vomiting, although food had recently been taken in several of them." Steffen¶ reiterates Snow's belief.

In making the above quotations the writer's object is threefold: first, to give sufficient detail, so that a just comparison can be made with the action of its sister compound, the ethylene bichloride, which the British committee stated to cause severe convulsions and no anæsthesia up to that time, while the ethidene dichloride promised to be "an excellent anæsthetic;" second, to call attention to the fact that it does cause a decided lowering of the arterial pressure, and, therefore, cannot "possess all the advantages of ether;" third, that a death has already resulted from its use.** It is probable that, while this anæsthetic is undoubtedly safer than chloroform and certainly more dangerous than ether, it bears a position of relative safety and power similar to that of its sister compound, the ethylene bichloride.

SPINA BIFIDA CURED BY INJECTION OF IODO-GLYCERIN SOLUTION.—Mr. Berry (*Brit. Med. Jour.*, vol. i., 1881, p. 468) reports one success, one partial success, and one failure. His failure was due to allowing the partial escape of the spinal fluid. He advises sealing up the wound made by the trocar at once with collodion.

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* British Medical Journal, 1879, vol. i. p. 1.
† Loc. cit., p. 109. ‡ Loc. cit., p. 921.
§ London Medical Times and Gazette, 1879, vol. i. p. 62.
‖ Chicago Medical and Surgical Examiner, June, 1880; quoted in New Remedies, 1880, p. 334.
¶ Binz's Evidences of Therapeutics, p. 39.
** Kappeler, Part XX., German Surgery, by Billroth and Luecke; quoted by Reeve, American Journal of the Medical Sciences, July, 1880, p. 216.

NOTES OF HOSPITAL PRACTICE.

PENNSYLVANIA HOSPITAL.

OUT-PATIENT DEPARTMENT.

SERVICE OF DR. CHARLES T. HUNTER.

Reported by JOHN GILLESPIE, JR., M.D.

WOUNDS OF THE HAND.

THERE is no class of injuries and no part of the body which exhibit so promptly the good effects of *rest*, as wounds of the hand. Superficial wounds of the hand, if of slight extent, do not require the application of a splint, but in the treatment of all wounds which extend below the deep palmar fascia the hand should at once be put at *rest*. Very often patients come to this dispensary with hands which are in a shocking condition, as the result of neglect of this procedure. Punctured wounds are especially prompt to respond to this treatment. There have been cases in which an apparently very slight wound has been followed by very diffuse inflammation, even extending along the tendons of the forearm, requiring months of constant attention, while in other cases of exactly similar description, in which the hand has been placed at *rest*, the wounds have healed in less than a week's time. On account of the loose cellular tissue of the hand, neglected injuries of it are apt to be followed by profuse suppuration, while, on the contrary, its vascularity will promote the rapid healing of wounds which are properly managed.

Dr. Hunter, in his address on Surgery,* alluding to the comparative vascularity of the hand and scalp, asserts that the hand is as richly supplied with blood-vessels as the scalp, and claims that the rapid healing of wounds of the head and face is not due to any superiority of vascularity, but to the fact that the arrangement of the muscles of the scalp and face permits absolute rest without any difficulty, while the hand, with its numerous joints and tendons, cannot be so easily controlled; and in the same paper he says that he has never known an instance in which a deep wound, either of the hand or of the foot, has united by first intention, except when the wounded member was put at absolute *rest*.

The closure of wounds of the hand may, in the majority of cases, be secured without the use of sutures, the position of the hand and the use of properly-applied strips of adhesive plaster being fully sufficient to accomplish the purpose, avoiding, at the same time, the irritation caused by the sutures. It may safely be said that where there is the least possible degree of laceration or contusion of the sides of the wound, sutures should not be used.

The position of the hand which is best adapted to secure the rapid union of wounds is the semi-flexed, as by this means the contraction of both the flexor and extensor muscles is avoided. To secure this position, the splint, which is to be well padded, should have a wad of oakum or other soft material placed upon it in such a position as to allow the hand to partially grasp the wad. Abscess of the hand when beneath the deep fascia is also favorably influenced by *rest*. The mistake is sometimes made of removing the splint before the divided tissues have formed a sufficiently firm union to enable them to endure the slightest strain. The hand should be retained upon the splint until granulation has well advanced and all local inflammation has disappeared. Care should be taken to avoid anchylosis of the joints by making motion of the fingers at each change of dressing.

The present spring has been an unusually favorable season for demonstrating the value of *rest*, for, although all wounds in which there was the slightest amount of laceration did badly, those wounds which were not treated by absolute rest were remarkable for the extensive suppuration attending them.

There have been a number of very interesting cases of wounds of the hand treated at this dispensary during the past two months, but for illustration of the value of *rest* a few cases will suffice.

Case I. Punctured wound from a pair of scissors being pushed into the palm of the hand.—The woman applied for treatment three days after the infliction of the injury, her hand being at that time much swollen, inflamed, and very painful. The wound was dressed with laudanum and water, and a palmar splint applied. On her return the next day the swelling had almost entirely disappeared, and the hand was free from pain. The improvement steadily continued, and on the fifth day the splint was removed and the woman was discharged, cured, two days afterwards.

Case II. Punctured wound of hand from the handle of a paint-brush.—The patient

* Transactions Medical Society of Pennsylvania, 1879.

applied for treatment the next day after he was hurt. The wound was inflamed, the edges red and pouting, and widely separated.

On account of the protest of the patient, he was allowed to go (after being warned of the consequences) without a splint, a laudanum-and-water dressing only being used. He returned, however, the next day with his hand greatly swollen, the tissues around the wound indurated and exquisitely sensitive. A palmar splint, with the same dressing as before, was applied. The next morning the patient bore voluntary testimony to the almost instant relief of pain he had experienced, and the swelling had so much subsided as to loosen the bandage, and in less than a week the wound had entirely healed.

Case III. Lacerated wound caused by thrusting the hand through a pane of glass.—Two days after receiving the wound, which was about one and one-half inches long, the woman applied for treatment, the hand being in very much the same condition as in the previous cases. The edges of the wound were brought into apposition by means of strips of adhesive plaster, carbolized water dressing applied, and the hand placed upon a splint.

Upon the tenth day after the accident the splint was removed, the wound being very nearly healed.

Case IV. Incised wound.—For two weeks after the accident the woman was treated by a surgeon outside, but the wound continued to grow more painful and the hand more inflamed each day. Upon application at the dispensary her hand was placed upon a splint, and in five days all appearance of inflammatory action had disappeared, and the splint was removed, the wound being entirely healed.

Case V. Compound dislocation of index finger, with contused wounds of the hand, by being caught between the buffers of railroad-cars.—For five days the wounds were treated at home by the boy's friends, and when he came for treatment the inflammation had extended up the forearm, the contused tissues of the hand were sloughing out, and the entire hand was infiltrated with pus, requiring repeated lancing to accomplish its evacuation.

The dislocation was reduced, poultices applied, and the hand placed upon a splint.

After the formation of several abscesses, in seven weeks the wounds had almost healed, requiring nothing but a simple unguent dressing.

Case VI. Incised wounds of back of hand, just below the wrist.—Sutures and straps were used to close the wounds, and laudanum-and-water dressing used, and the hand placed upon a splint. In three weeks the wounds had apparently healed and the splint was removed. The next day the hand and forearm were red, swollen, and painful, in consequence of which the splint was reapplied, and in twenty-four hours the swelling had greatly diminished. Two weeks after this the splint was again left off, and the same sequelæ ensued, necessitating recourse to the splint again. Finally, six weeks after the injuries were received, the splint was omitted, without ill effects following.

This patient was old, and addicted to the use of alcohol, which circumstances account for the slow healing of the wounds.

Case VII. Incised wound of back of hand, the extensor tendon of the index finger being severed.—The ends of the tendon were brought together with a silk thread, laudanum-and-water dressing applied, and the hand placed upon a splint. On the seventeenth day the silk suture came away, and after this the wound rapidly healed, the motion of the finger being perfect. There is no doubt that if the soluble catgut thread had been used, the same result would have been obtained much more quickly, as the irritation caused by the silk suture prevented the wound from closing.

This is the second case of tendon suturing of which I have known; both were successful; and the success could not have been obtained except by strict observance of *absolute rest.* No matter what dressing may be used, in deep wounds of the hand, union will not take place so readily without immobilization of the wounded part as it will without any dressing, if rest is enforced by means of a splint.

INOCULATION WITH HYDROPHOBIC AND OTHER SALIVA.—Pasteur seems to be getting into the bad habit of hasty generalization. A little while ago he announced that he had found a new *microbe* in the blood of some rabbits killed by inoculation with the blood of a hydrophobic child. He then thought he had laid his finger on the specific virus of hydrophobia; but he now announces that in some experiments performed with the saliva of children dying of broncho-pneumonia he had produced precisely the same results.

TRANSLATIONS.

DIFFERENTIAL DIAGNOSIS BETWEEN SCARLATINA- AND OPIUM-ERUPTION.—Bernouilli (*Correspondenzblatt für Schweizer Aerzte; Deutsch. Med. Wochens.*, 1881, p. 161) gives the following:

Scarlatina.	*Medicinal Eruption.*
History of contagion.	No history of contagion; occasionally history of previous attacks of the same kind.
The eruption finely punctate; only later is it confluent. Beginning on the neck, reaches its maximum in one to two days. Occasionally severe burning and itching; often chills. It may be accompanied by urticaria and pustular lesions. Duration one-half to one week. Desquamation occurs after a longer or shorter period, the scales branny or lamellar.	The eruption is diffuse, not punctate, or, if punctate, the punctæ are not divided by healthy skin, but are situated on an erythematous surface. The eruption begins on the neck, and reaches its maximum in one to two days. The lower half of the extremities often remains free. There is always itching and burning. Frequently chills. Urticaria and erythema papulatum are often associated with it. Duration four to eight days. Desquamation after some five days, branny or lamellar.
The tongue at first thickly coated, later smooth and red. Angina, with or without diphtheritis. Gums inflamed. Blood or albumen in the urine.	Tongue and gums normal. The medicine generally to be found in the urine.
Temperature continuously high.	Temperature (often with chills) very high, course normal, or sub-febrile.
Pulse usually frequent.	Pulse moderately increased or normal.
Localizations in the organs of hearing, joints, and kidneys.	Slight eczema often occurs as a sequel.
Relapses are rare; pseudo-relapses are mostly like measles. Rarely complicated by other diseases as sequelæ.	Relapses under the same circumstances almost invariable, the course of symptoms being about the same each time.

NEW METHOD OF TREATMENT IN VAGINITIS. — Dr. Terrillon (*Bull. Gén. de Thérap.*, 1881, p. 193), dissatisfied with the usual remedies employed in contagious vaginitis, has devised a sort of ointment to be injected by means of an instrument which appears, from the description given of it, to be a combination of a speculum and a syringe. It consists of a reservoir terminating in a tube four or five inches long, with a bevelled opening. The reservoir is covered by a hinged cap, through the top of which runs a rod attached to a piston fitted to and intended to play in the reservoir. The latter being charged with the ointment, and the terminal tube being introduced into the vagina, the piston is pressed down upon the ointment contained in the reservoir, forcing it along the tube and discharging it in the form of a plug about one-third of an inch in diameter at the opening, which may be placed at any point in the vagina up to the os uteri. A small portion of ointment being deposited at the desired point, the tube is withdrawn, and the ointment slowly melts in the upper part of the vagina and finds its way down, enduing every part of its surface with the contained medicinal agent. The advantages of this form of medication are that it can conveniently and almost painlessly be applied in small vaginas, such as those of recently-deflowered girls, who are most frequently the subjects of acute vaginitis, and that its action is slow and constant. Except in very roomy vaginas, the ointment is retained without a tampon; and experiment has shown that a certain quantity of it can be found in the vagina so long as eight to ten days after its introduction. In spite of this persistence, the ointment does not form an irritating body and does not become tough and hard to remove, as do occasionally the powders sometimes employed, as that of subnitrate of bismuth. The composition of the ointment used by Dr. Terrillon is as follows:

℞ Vaselini, ℥iv;
Amyli, ℥iv;
Acid. tannic., ℈iv.—M.

This ointment has a peculiar pasty consistency, which permits of its introduction by means of the tube above described. The quantity introduced should be from a drachm to a drachm and a half. The possibility of employing this method of treatment from the beginning, the relief gained by the rare introduction of an instrument, and the fact that the patient declares that no pain or inconvenience is felt, give it the advantage over other methods hitherto

employed. Dr. Terrillon gives brief notes of some twenty cases coming under his notice in which this plan of treatment has been applied with success.

INTUSSUSCEPTION OF THE INTESTINES, WITH EXPULSION OF FORTY CENTIMETRES OF INTESTINE—RECOVERY (Dr. Grosoli, *Giornale di Medicina Militare*, November, 1880, p. 1190; from *L'Indipendente*, No. 32, 1880).—Boy 10 years old, after having eaten some limes and oranges (seeds, skin, and all), was seized with violent pains in abdomen. Castor oil administered by his mother without causing any passage. Pains continued, and soon associated with vomiting. Dr. Grosoli called in. He prescribed an oleaginous purgative and a clyster of senna and common salt, but without success. Symptoms increased in violence, and vomiting of fetid, sedimentary matter set in. Belly extremely tender to touch. Leeches, clysters, hypodermic injections of morphia and atropin, warm cataplasms, cold applications, warm baths of the whole body, and electrical currents had no effect. For twelve days the patient suffered agony, being sustained in the mean time by nutritive enema. Finally, the doctor administered to him thirty grammes of mercury. Two hours after, bowels moved for the first time. Expulsion of much flatus and fecal matter mixed with blood and mercury. He then commenced to improve, but the pains ceased only with the expulsion of a membranous substance having a gangrenous odor. Next day, expulsion of forty centimetres of small intestine. For fourteen days following, slight pains in abdomen were present, with occasional ejection of pieces of intestines. In a month after, he was able to leave his bed. W.

TRANSFUSION OF BLOOD BY THE PERITONEAL CAVITY.—Dr. Lava (*Cbl. f. Chir.*, 1881, p. 176; from *Osservatore, Gaz. delle Cliniche*) gives an unusual case of blood-transfusion into the peritoneal cavity in the case of a patient suffering with progressive pernicious anæmia with hyperleucytosis. Two hundred and ten grammes of defibrinated blood were injected by means of Castieau's apparatus. Death supervened forty-one hours after the operation, and at the post-mortem examination diffuse sero-fibrinous peritonitis was found, together with anæmia. In the intestine were found a large number of anchylostomata.

APOMORPHIN AS AN EXPECTORANT.—Muriate of apomorphin has been employed by Dr. Carl Beck (*Deutsch. Med. Wochens.*, March 19, 1881) in sixty cases of bronchial catarrh and thirty-one cases of broncho-pneumonia. He finds that under its use the secretion becomes rapidly thinner and more fluid, and in broncho-pneumonia particularly the thick, tough plugs which close the air-tubes and slowly suffocate the patient by carbonic-acid poisoning are loosened and discharged. The dose of apomorphin is $\frac{1}{64}$ grain for young infants, increasing the amount by $\frac{1}{120}$ grain for every year. For adults the following formula is recommended by Beck:

℞ Apomorphii muriat., gr. $\frac{8}{10}$–$\frac{1}{4}$;
Acidi muriatici diluti, ♏xv;
Aquæ destillatæ, f℥xxx;
Syrupi simplicis ad f℥iv.—M.

Sig.—Tablespoonful every second, third, or fourth hour. Half this dose is the average for children of three to ten years, every hour.

DRAINAGE FROM THE BLADDER IN THE OPERATION FOR STONE, ESPECIALLY THE HIGH OPERATION.—Trendelenburg (*Cbl. f. Chir.*, 1881, p. 172; from *Berlin. Klin. Wochens.*) alludes to the fact that in many cases of large and old calculi the ureters themselves are dilated, so that the valve to the bladder is opened and cystic inflammation can very easily extend towards the kidneys. The urine, mixed with débris, blood, etc., may also penetrate to the kidney and arouse pyelonephritis. For this reason Trendelenburg urges the employment of drainage-tubes for eight to twelve days after the operation, washing out the bladder once with disinfecting fluids, but not again. This procedure should be followed in all cases, but especially after the high operation.

A NEW INSTRUMENT—THE VEIN-BROOCH IN VARIX.—At a recent meeting of the Clinical Society (*Lancet*, vol. i., 1881, p. 561) Mr. Douglas showed an instrument of his devising, and which produced flat pressure on varicose veins and varicocele by means of a horn spatula, or one made of horn and steel, with a grooved needle riveted to the eye-end and fastening at the point, after passing under the vein, by a catch like a brooch or safety-pin, giving very little pain, and (unlike the old torsion of wire or silk ligature) producing no constitutional disturbance, but obliterating the vein with certainty, and without subcutaneous division.

PHILADELPHIA
MEDICAL TIMES.

PHILADELPHIA, JUNE 4, 1881.

EDITORIAL.

ANÆSTHESIA.

WE desire to call especial attention to the article which appears in our present issue from the pen of that clear-headed young surgeon, Dr. Roberts, and to the discussion thereon, whilst making editorial remarks upon the subject. At the meeting of the County Medical Society various speakers agreed with Dr. Roberts in magnifying the dangers attending the administration of anæsthetics; but we are impressed with the marvellous safety that attends even their careless use, provided only that the most innocuous among them are selected. The dangers which surround chloroform have been too frequently written about and have been too often and too tragically exemplified to need further comment. He who still persists in the habitual employment of chloroform seems to us beyond the reach of argument or human speech. We let him alone. With nitrous oxide gas and with ether, how few are the deaths in proportion to the administrations! In the city of Philadelphia chloroform has produced death, to our personal knowledge, several times; ether has certainly been used more frequently than the other agent, but we have never known of a case in which death was certainly or even fairly attributable to this anæsthetic. Fifty inhalations of ether a day is hardly an over-estimate, which would give, in the last thirty years, five hundred and fifty thousand administrations for this city, and not one death unimpeachably produced by this oxide of ethyl. Possibly this estimate of the number of administrations may seem exaggerated; but cut it down beyond all reason, and remember the heart- and lung- and kidney-affections which so often exist uncared for, the towel sopped with ether, the utter carelessness so frequently seen in the operating- or sick-room, and it is marvellous not that there have been one or two deaths very doubtfully attributed to the agent, but that there has been so clean a record. Is it too much to claim that drunkenness from ether is much safer than a drunkenness of equal degree from alcohol?

It cannot be admitted that in either of the cases reported by Dr. Roberts the death was positively attributable to the ether. In one case a large dose of chloral was given,—an amount, indeed, which has produced death very much as was caused in the case here reported without ether having been given at all. In another case the man died, after recovery of consciousness (*i.e.*, after the symptoms of anæsthesia had passed off), from sudden pulmonary œdema. The kidneys were not examined after death; there was at least enough during life to suggest the possibility of their having been diseased; sudden pulmonary œdema is common enough in contracted kidney, not one of the dangers usually attributed to anæsthetics: surely, without further discussion, this case may be ignored.

The first case reported by Dr. Roberts is more pertinent; and yet it does not bear examination without flinching. Every man who dies during anæsthesia does not necessarily die from the anæsthetic. It is certainly possible for an anæsthetized patient to die from hemorrhage; it is equally certain that patients not anæsthetized have died under the knife from shock, and there is no proof that anæsthesia abolishes shock.

The case narrated by Professor Smith in the discussion was very pertinent. The operation was similar to that performed by Dr. Levis; result fatal in each instance. No anæsthetic having been given in one case, death is registered from shock; ether

having been given in the other, death is attributed to it. If only Professor Smith's case had happened a little later in time, after instead of before anæsthetics had come into vogue, we should have had two cases of death from anæsthesia.

The symptoms during the last hour of life in Dr. Roberts's case are very interesting and instructive. Contrast them with scenes so often witnessed in the practice of chloroform anæsthesia. A cry from the surgeon giving the agent, or from a by-stander, announces that the pulse has suddenly failed, or the well-known, peculiar pallor has in an instant spread like a death-cloud over the face of the victim; the rush, the struggle, the quick return to life, or the plunge into death. In Dr. Roberts's case, a slow failure of the pulse, a gradual sinking into the grave, a whole hour of doubt. Years ago, when resident in Pennsylvania Hospital, we saw two men who had been badly burnt some miles away, had run of their own accord straight to the hospital, and got into bed clear in intellect, but with failing pulse, to become in a few moments unconscious, with pulse growing weaker, and to die in an hour or two: not death from ether, but from shock.

The lesson we would draw from the facts brought forward by Dr. Roberts is not to be afraid of ether and to allow pain to reduce vital power, but to remember that at least as much care is necessary in using ether as would be given to making a man drunk.

LEADING ARTICLES.

PARASITIC ANÆMIA.

THE occurrence of a mysterious and fatal form of anæmia among the laborers in the St. Gothard tunnel a year or so ago, and the subsequent discovery of intestinal parasites as the cause of disease in these cases, have lent renewed interest to the investigations made by a few well-known observers which had previously failed to gain that amount of general attention which their importance deserved. Of late, interest in this subject has revived, and we find in a recent number of *Schmidt's Medicinische Jahrbücher* a general résumé of our knowledge, by Dr. Meissner, of Leipsic.

Although anæmic symptoms are those most prominent and to which most attention has recently been drawn, yet there are other forms of disease so closely connected with parasitic infection that it seems proper to consider them together.

Among the parasites involved are hæmatozoa and intestinal parasites. Of the hæmatozoa those of most importance are the *filiaria sanguinis hominis*, and the *bilharzia hæmatobia*. The first of these has been very thoroughly studied by Manson, of Amoy, China, and Bancroft, of Brisbane, Australia. The filiaria, while it may at times be present in the blood without giving rise to any symptoms, at other times appears beyond question to be the cause of chyluria, elephantiasis, etc. The mode of its action would seem purely mechanical. The parasite lives in the blood- or lymph-channels, and its accumulation at a given point gives rise to lymphorrhagia or inflammation. Two curious facts have recently come to light regarding this parasite. One is that the mosquito acts as a carrier: sucking the filiaria with the blood of an affected person, it afterwards deposits the ova or embryos, which have meantime hatched, in the water when it lays its own eggs. These embryos are then swallowed in the drinking-water by another victim; and so the circle of disease is completed. Another and a very curious fact regarding the habits of the filiaria was lately discovered; this is, that it is a nocturnal parasite. During the day the filiariæ lie dormant at some point in the victim's circulation, but at night they sally forth and rove the currents of the blood the night long.

Bilharzia hæmatobia were found by Dr. John Wortabet, of Beirût, in patients who had been using bad drinking-water. Strangury and hæmaturia were among the earlier symptoms, followed by an eruption of blebs (?) resembling "Delhi boils," which only healed after six months. The patients enjoyed apparently good general health, but were weak and nervous. Ova and a few fully-developed parasites were found in the urine. Bad drinking-

water, especially that of Syria and Egypt, appears responsible for the occurrence of this parasite, which produces its evil effects by collecting in the vessels and parietes of the hepatic and renal system and giving rise to hemorrhages and abscesses. In several cases a prolonged stay in London cured patients who were again attacked on returning to Egypt.

Among the intestinal parasites which give rise to general symptoms, the *Anchylostoma duodenale* is best known, although it has been only recently the subject of careful investigation. Allusion has been made to its occurrence among the workmen of the St. Gothard tunnel. A recent communication from Dr. Bugnion, of Geneva, in the *British Medical Journal*, throws more light on the subject. The anchylostoma belongs to the same order as the trichina, the oxyuris, and the ascaris lumbricoides, but instead of feeding on the contents of the bowels it attaches itself to the mucous membrane of the duodenum and sucks blood like a leech. The repeated intestinal hemorrhages produced by its attacks may be considered as the principal cause of the aggravated anæmia and increasing weakness which are generally observed in the victims of this parasite. In the case of the workmen in the St. Gothard tunnel, no fewer than 117 deaths had taken place up to June, 1880. The difficulty of diagnosis was enhanced by the refusal of the authorities to permit post-mortem examination of the patients. The diagnosis once made, treatment of the usual parasiticidal character becomes available, and is followed, if timely, by good results. The symptoms of this peculiar form of anæmia are at first those of a chronic gastro-intestinal catarrh. The affection begins gradually, with loss of appetite, constipation, pain and weight in the stomach. Then follows loss of energy and spirits, with suicidal inclination. The color of the skin becomes changed to a peculiar waxy yellow, and loss of pigment (peculiarly noticeable in the negro) is marked. The special senses are dulled, cardialgia, cramps, headache, sleeplessness, tinnitus aurium, dyspnœa, palpitation and dizziness occur on exertion. There is a blowing sound in the arteries and sometimes in the veins of the neck. Later still the lack of appetite changes to a craving for food, often of a loathsome sort. Bloody and excessive stools supervene; anasarca, œdema of the lungs, cramps, and cardialgia close the scene. Post-mortem examination shows, in addition to the appearances commonly presented,—extreme anæmia and bloodlessness,—foreign bodies, coal, balls of earth, etc., in the stomach. The intestinal mucous membrane is swollen, and shows numerous extravasations, with occasional ulcers. Under a lens the marks of the teeth of the anchylostoma can be perceived, and, if the examination has been made within a short time after death, the living worms, to the number of eighteen to twenty-four over the space of about two-thirds of a square inch. The parasites themselves are about one-quarter to one-half inch in length. The prognosis of the affection is favorable in its earlier stages, provided appropriate remedies be employed. These should be both of a hygienic and a medicinal nature. Anthelmintics, santonin, camphor, assafœtida, turpentine, kousso, pomegranate, etc., are first to be employed; then iron, bitter tonics, astringents, and sometimes diuretics. Above all, however, change of air and water (the latter should always be filtered), and the use of strengthening diet, with alcoholic stimulants, are of use.

The occurrence of *Anguillula intestinalis* and *A. stercoralis* in the dyspeptic or endemic diarrhœa of Cochin China has been shown by several observers, and there is strong reason to believe this parasite to be the cause of the affection.

This whole subject of parasites of the blood and intestine, although very little examined into as yet, promises much information, particularly as to the causes of obscure tropical diseases; and the fact that parasitic anæmia has been found so far north as the St. Gothard indicates that these affections may not be confined to tropical and sub-tropical countries alone.

CORRESPONDENCE.

LONDON LETTER.

IN my last letter the question of meeting homœopaths in consultation was discussed in reference to the late Lord Beaconsfield. My opinion that such consultations are not desirable was then expressed with my usual outspokenness. The matter has occasioned an explosion of opinion, both among the laity generally and the profession. The most an-

tagonistic position was taken up. The laity approved highly of Dr. Quain's action; the profession has as strongly disapproved of it. The laity evidently wish to be allowed unlimited freedom to flirt with homœopathy when they list, to be serious with regular scientific medicine when the danger of death looms up. They are very indignant, indeed, at the medical profession daring to assert any opinion of its own instead of humbly bowing the knee and feeling rebuked for having ventured to think for itself. On the other hand, the profession has its opinion on the matter, and a discussion has gone on about the subject both in the *Lancet* and the *British Medical Journal*. The voice of the profession is distinct and articulate; it will have none of these compromises, none of these left-handed alliances with an immoral section of the medical world,—no concubinage with bad characters. Let the laity say what they will, the profession is "solid" on this matter. Of course apologists are found for the eminent personages who are impeached, as might be expected. I took part in the discussion in the *British Medical Journal*, and impugned the conduct of the ex-President for the advice he gave. Every one has agreed, so far, with this view, that "the President was an outsider, and under no pressure," and ought to have remembered the College he represented, and its obligations—and with that his own—to the profession at large. Of course it is to be deeply deplored that at this time, when the evidences of the profession being of slight social account have been unpleasantly frequent, so abject a position was assumed by prominent members of it. But some of the individuals who have hitherto had more of their own way than was either good for themselves or for the profession to which they belong in the councils of the College will now have to abdicate, having been detected, or found out, preaching one doctrine and practising another. Of all kinds of imposture the most detestable is that of the Pharisee, who judges others severely yet omits to live up to his standard and professions himself. There has been sufficient of the cleansing of the outside of the platter; it is polished enough to reflect some goodly pictures of sundry individuals posing before it. What is now wanted is some sanitary cleansing and disinfection of the contents thereof. This must soon be done, as the profession is awakening to the conviction that it has been blinded and played fast-and-loose with in its complete confidence.

But this is not the only matter of interest to the profession brought out by the late ex-premier's illness. It was curious how his condition varied and oscillated with the weather-cock. When the wind veered from the east and northeast into the west, the aged senator picked up; when the wind went round to the east again, he drooped. The temperature of the room might be maintained artificially, the air might be kept moist by bronchitis-kettles, but nevertheless the nor'-easter made itself felt. The keen nipping wind found an entrance in spite of everything that acute human intellects could devise, and the venerable Oriental sank under the east wind at last.

The most useful agent, it appears from the daily press, for giving him relief from his asthmatic paroxysms was "Himroth's powder,"—not a remedy in the English Pharmacopœia, but an American quack or secret preparation. Anyhow, it appears, it did good; and there was a sense of fitness in a long belief in homœopathy terminating and culminating in a quack preparation. But to revert to the east wind. It certainly exercised a most potent influence upon his lordship; it certainly does exercise a curious malign influence upon the inward processes of nutrition and the metabolism or transformation of albuminoids within the body. Many years ago a patient with acute nephritis was recovering very satisfactorily, the appetite was returning and the strength coming back, when the wind veered to the east, and with it the prospect clouded. Uræmic poisoning set in; the patient was purged, sweated, and even bled, with temporary relief, but all in vain; she sank. Since then an east wind has been regarded as distinctly dangerous in many cases. Nor has an increasing experience modified the suspicion with which the veering of the wind-vane to the east has been watched and noted.

It seems in some way to pervert or interfere with the transformations going on in the liver, and to modify them so as to charge the blood with waste. The expression a "bilious chill" has long been adopted here to signify a condition where a chill has operated malignly upon the liver and its processes, perverting them and disturbing the economy. The effect of the east wind and its variations upon a patient of my own was very instructive. In September last he presented himself with dropsy in the legs, not extending above the knees. The liver was distinctly enlarged, and there was a history only too clear of considerable alcoholic indulgence. The heart was dilated, and its action irregular. On digitalis and strychnine he improved splendidly, a mercurial pill twice a week, with a purgative of sulphate of soda and Rochelle salt next morning, being taken to sweep away the waste out of the blood, and so to lessen the arterial tension. The diet was strictly regulated, and albuminoid matters given but sparingly. The progress was instructive. Hand in hand with the general improvement a reduction in the bulk of the liver could be observed, until it was reduced a long way towards its normal size, while it seemed to possess almost unimpaired functional activity once more. Such was the improvement that the patient was lost sight

of till March 29, when the east wind had been blowing some time. When seen at that date, there was consolidation of the lower lobe of the right lung, without, however, any general disturbance of the health. The consequence of this was increased fulness of the liver, and that again was followed by œdema of the legs. The bulk of urine fell remarkably. For ten days I did not see him, being away in the country. On my return, I found the dropsy had mounted above the knees; the liver was as large as when first seen; but the consolidation of the lung had scarcely progressed at all. During this time the east wind which finished Lord Beaconsfield blew keenly. The patient was purged with elaterium and compound scammony powder, and well sweated in Sir James Simpson's bath of lemonade-bottles full of hot water with damp stockings over them. Just at this time the wind veered, and all went well. The free watery motions, the profuse sweatings produced by the bath, arrested the progress of the advancing dropsy. At the same time, carbonate of ammonia, with full doses of tincture of nux vomica and small quantities of digitalis, was given every six hours. The dose of digitalis would also have been full, but he was one of the rare (in my personal experience very rare) cases where digitalis in full doses has not been tolerated, and the tincture was given in eight-drop doses only, this being compensated, as far as possible, by twenty-drop doses of nux vomica. Under this treatment the bulk of urine rose, but not to the normal amount. The case remained stationary for a few days, except that the lung kept clearing up very satisfactorily, considering all the circumstances of the case. Then the wind veered again. The first effect was some vomiting of bile, with anorexia. Hitherto the appetite had remained good, and the digestion effective. On the whole, though gravely and seriously ill, the case was not without hope. But the wind kept steady. The urine first ceased to increase, then it fell. The patient felt unequal to the bath, but continued the purgative. As the urine fell, the dropsy mounted, climbing into the prepuce. This change for the worse under the active treatment adopted was ominously suggestive of some new departure. The question of making punctures in the legs had been kept in view, but my experience of it had scarcely been encouraging. To do so would be to lessen the dropsy, but it did not necessarily follow that this would increase the renal secretion. For it was obvious that the fall in the bulk of urine, and the increase of the dropsy, were consequential to a something which stood in a causal relationship to both. It was but too evident that this must be in the veins; some block there was obstructing the renal flow as well as increasing the fluid in the lower extremities. Besides, too, the urine became densely albuminous at this time.

This view was in accordance with Sir James Paget's observation that phlebitis is common in the subjects of perversion of the function of the liver. The indications were not those of pure dropsy: the skin was dusky and brawny, and not intensely white as it is usually, nor did the surface "pit" as it ordinarily does. "The limb thus enlarged feels œdematous all through, but firm and tight-skinned, not yielding easily to pressure, and not pitting very deeply." This was a complication which pretty well blotted out the little prospect of life that remained. I thought of putting in some of Southey's drainage-tubes, as about all that remained to be done, but deemed it well to try the effects of some needle-punctures first. A drop of fluid only followed each puncture, and there was no weeping. The result was then utterly unsatisfactory, and the prognosis became very dark. Yet the general condition was surprisingly good. The appetite was fair, the intellect as unclouded as in the days of perfect health; the patient was sitting up in his chair every day, looking very well. He could walk alone and unassisted. It may be remarked that he inherited as magnificent natural powers and constitution as were ever possessed by a "border-man," usually regarded as a race exceptionally strong. He came of a hardy race; and the prospect, bad as it was, did not even affect his demeanor. He saw some friends in the evening, chatted and talked, had a very good night (comparatively), felt well, and enjoyed his food, and his breathing was somewhat less embarrassed than it had been. He walked from one room to another, sat down quite cheerfully; his wife turned away to arrange something in the room, only for a brief while; when she looked round, he was gasping for breath, and died immediately, with the dark flush of asphyxia on his countenance. It was clear the exertion had dislodged a clot out of the internal veins, which had washed through the right heart and plugged the pulmonary artery.

Now, this case is worthy of consideration as to its phenomena and the result. For, in my experience, such a termination had not previously occurred. The legs looked unusual for cardiac dropsy, not being white and pasty, nor pitting on pressure to any extent, but brawny. The liver was evidently much affected by the change of wind; and the phlebitis was consequent upon further disturbance, as indicated by the vomiting of bile. The urine threw down a dense cloud of lithates after standing some time; but that is common enough in dropsy when the function of the liver is deranged. The evidence was furnished rather by the general disturbance and the subjective sensations of the patient than by any one individual or particular sign. But when the wind went away from the east he made headway; when the wind veered the case backed. This occurred more than once, and the patient was so convinced of the asso-

ciation that he persisted in declaring that if the wind kept in the east it would kill him. Now, the same perturbations were seen in my hospital patients generally during the long-continued east winds of this spring and last year. They found out every one "who had a liver." Patient after patient showed a bile-stained tongue, the hue being noticeable even when there was no fur upon the tongue, if placed in a side-light; there was the concomitant bad taste in the mouth on awaking in the morning. As a rule, too, there was disturbance in the bowels, and a deposit of lithates in the urine. Such are the generally accepted evidences of derangement of the liver. In such persons as were the subjects of grave organic changes in the liver, of course the disturbance was more pronounced than in those comparatively well.

How these disturbances are brought about we cannot yet say; but thus far we may fairly assume,—when the albuminoids of our food are rendered perfectly soluble by the digestive act in the alimentary canal, they pass therefrom into the blood of the portal vein. From thence they pass into the liver and undergo further change, so as to be elaborated and fitted for the nutrition of the tissues in the form of the albumen of the liquor sanguinis. Some are split up apparently right away into urea, instead of undergoing further elaboration; that is, instead of proceeding on the normal further course of the crude product of digestion, they are turned aside to undergo a retrograde metamorphosis. Probably a considerable proportion of the urea we pass has such a genesis. The excess of proteid material is broken up into urea. This production of urea in and by the liver is now generally recognized by physiologists. At the same time, the taurin and glycogen, which unite with the cholic acid in the formation of the bile-acids of man, have a chemical formula bearing a generic resemblance to those of urea and uric acid. Well, when the liver is disturbed, it would seem that instead of the normal transformation of surplus albuminoids into urea the metabolism is in the direction of uric acid and bile-acids. Nor is it difficult to comprehend how this perversion is brought about, when the likeness of the chemical formulæ is borne in mind. The presence of these products in excess in the blood excites various disturbances, and, among the rest, the phlebitis which is so serious. The east wind penetrates into houses, and even into the internal processes of the organism, and disturbs them. The influence upon the liver in this case was unmistakable and, at the same time, most disastrous to the patient's prospects, as the event proved. Of course the case was a very serious one even without the phlebitis; but with it added it was impossible for the organism to carry the burdens imposed upon it. The lesson of the case is one which carries weight with it,—viz., to bear in mind the function of the liver, and with that the derangements commonly met with. When the arrangements for the dehydration of grape-sugar in the portal vein into glycogen, or the hydration of glycogen once more into grape-sugar by the ferment of the liver, are perturbed, then we find the excess of sugar in the arterial blood passing off in the urine, producing glycosuria,—in bad cases the diabetes of our text-books. Far more commonly the disturbance is in that part of the liver-function which is concerned with the metabolism of proteids, by which the crude albumen formed in the alimentary canal is elaborated into the perfected albumen of the liquor sanguinis, or transformed by an oxidizing process into urea or a bile-acid. Consequently, in some cases we find that the transformation is perverted and we get lithic acid produced, while in other cases there is an excess of bile-acids produced. Looked at from this point of view, we can see how lithiasis may be brought about without indulgence in albuminoid food to excess, but by a sort of vice in the liver which is inherited in those cases of hereditary gout where lithic acid is formed on the slightest departure from a strict dietary, the most scrupulous self-denial. When more albuminoids are taken than the liver can deal with satisfactorily, then lithic acid is also formed. In either case the kidneys in time become changed by the lithic acid and lithates in the blood; and so we can see how kidney-disease is the consequence of lithiasis and marks the later stages of the malady. This is the view of gout which must obtain in the future.

J. MILNER FOTHERGILL.

PROCEEDINGS OF SOCIETIES.

PHILADELPHIA COUNTY MEDICAL SOCIETY.

AT a conversational meeting held at the hall of the College of Physicians, Philadelphia, February 9, 1881, Dr. Albert H. Smith, President, in the chair, Dr. John B. Roberts read a paper on "Ether Death: A Personal Experience in Four Cases of Death from Anæsthetics." (See page 545.)

DISCUSSION UPON ANÆSTHETICS.

Dr. Henry H. Smith inquired whether the patients had taken food shortly before using the anæsthetic agents.

Dr. R. J. Levis said that in three of the cases no food had been taken for several hours.

Dr. Laurence Turnbull observed with much force that no anæsthetic can be used with absolute safety. Ether produces inebriation like alcohol, and the patient must be kept warm while under its influence, or the temperature will sink below the normal, the skin become

cold and clammy, with symptoms of collapse. The pulse-rate falls, the breathing becomes embarrassed, and an increase of secretion takes place in the lungs, and death occurs from pulmonary œdema and respiratory paralysis, just as in drunkards who are exposed to cold. On account of the similarity of their action, alcoholic stimulants should not be given where a patient appears to be sinking after ether administration. This is the difference between ether and chloroform: under ether the pulse rate is regular and becomes slower, while under chloroform it becomes irregular, as is shown by sphygmographic tracings made by Kappeler. In ether administration the respiration should be watched; in chloroform, the pulse.

Primary deaths from ether are very rare, and that reported by the lecturer was the first one that he had heard of in the city, although another had been lately reported in Cincinnati. In the case referred to this evening, he regretted that the heart had not been carefully examined and the state of the secretions had not been noted. He believed that the state of albuminuria added increased risk to anæsthesia, and he would hesitate to give ether when the amount was large, and would seek to reduce it first by remedies. He criticised the treatment of the patient after the operation, saying that artificial respiration and warmth would have formed a better means of treating ether collapse than alcoholic stimulants. Atropia, also, should not be given in doses larger than one-sixtieth of a grain, nor too frequently repeated.

Dr. Geo. Hamilton said that if albuminuria is a contra-indication to the use of anæsthetics, he wondered that there were not more deaths, since the condition is quite prevalent.

Dr. Levis remarked that the neglect of artificial respiration had been pointed out, but if the members would look at the report they would notice that the breathing never failed until the last, while the pulse was quite weak. After the operation the patient seemed to be in a quiet anæsthetic sleep, but the weak pulse had attracted Dr. Roberts's attention.

Prof. H. C. Wood endorsed Dr. Turnbull's remarks about alcohol and ether, and said that the more closely their effects on the lower animals are studied, the more closely are they seen to correspond. Atropia and digitalis, on the other hand, are of value, but their effects have been greatly magnified; as in single doses they could be given in much larger doses than we are accustomed to, and without any harm.

In considering the causes of death after ether, we must not forget that patients sometimes die of heart-failure, collapse, or shock after operations where no ether has been given. Cases of severe burns, or of surgical operations, frequently rally after the operation, but die afterwards with secondary syncope. The danger of shock is very much reduced where the anæsthetic is used, and in cases of albuminuria the danger from shock without the anæsthetic might be greater than from the ether. Moreover, the amount of albumen in the urine is not an index of the increased risk, for in some cases of contracted kidney the proportion is very small. In the treatment of collapse after ether he recommended the use of ammonia, digitalis, and proper attention to the position and covering of the patient.

Dr. Schapringer had observed that the peculiarity in the case of Dr. Roberts was the heart-failure after ether; but the case was very different from the fatal cases of sudden heart-failure following the administration of chloroform, as it came on gradually and was accompanied by a weak, rapid pulse. He had given chloroform very frequently, and had seen no bad results from it, except in one case, where an assistant had given too much, and some difficulty was experienced in reviving the patient by artificial respiration, slapping his face with a wet towel, which is a good way of supplying the brain with blood and keeping up the circulation.

Dr. W. R. D. Blackwood thought that the danger of anæsthesia is often underrated. Many practitioners give chloroform for the most trifling operations, such as pulling teeth or opening a felon, which is unjustifiable in any case, and criminal in the hands of dentists and other uneducated or semi-medical persons. He could not agree with the lecturer that chloroform should be abolished, as he had used it in many hundreds of cases, while in the army, without any accident. He had seen a man die on the table from fright and shock before anything had been done to him; and here the anæsthetic would have been blamed if administered. He had given chloroform to men apparently dying, in order to perform amputation, and the patients afterwards recovered. Chloroform is the best anæsthetic we have, and is safe, provided that it is given with proper care. In all his field-experience he never saw any difficulty with chloroform; but it was always given in well-ventilated tents or in the open air. The only trouble he had observed with other operators was where mixtures have been used, the rates of evaporation of the ingredients being very different. For the resuscitation of such cases he recommended the introduction of a piece of ice into the rectum. Ether is, however, in ordinary civil practice the preferable agent, and is always safe.

Dr. Levis introduced Dr. West, who was invited to give a further account of the fatal case, which had been under his care previous to the operation.

Dr. West said that the patient had been under his care for about eighteen months previous to her admission into the hospital. After three months' treatment for uterine disease, she had an attack of rheumatism, and

subsequently a relapse; she continued sick for about three months. She also complained from time to time of dysuria, but no albumen or sugar was detected in the urine; but from the pains in the kidneys the speaker inferred that she had chronic nephritis. She also had occasional cardiac palpitation, but had no other evidence of heart-trouble. Twice before admission into the hospital she had taken ether without bad symptoms, although the symptoms of cardiac trouble had previously existed.

Prof. Bartholow said that the prevailing impression of the profession of the comparative safety of ether over chloroform makes a careful investigation into fatal cases necessary, in order to ascertain all the causes contributing to the result, so as to avoid them in the future. He had been struck with the general neglect by the profession of the observations upon anæsthetics made by Bernard some twenty years ago, who found that anæsthesia could be obtained more easily, maintained with less danger, and after-recovery made more sure, by the administration of morphia just before the anæsthetic is given: by this means the stage of excitement and rigidity is avoided which constitutes one source of danger. He also claimed that by this mixed anæsthesia the sensibility of the larynx was obtunded so that the agent could be given with less trouble. He also was satisfied that less of the agent was required, and the stage of anæsthesia was prolonged. Nussbaum adopted the method, but administered the morphia after the patient was under the anæsthetic influence. By the method of mixed anæsthesia the danger is lessened; for nothing could be more certain than that morphia sustains the action of the heart. It is therefore a matter of surprise that the profession at large has taken so little notice of this method of Bernard, especially when endorsed by Nussbaum. It is true it has been advocated by Wm. Warren Green, who claimed it as his own, and it was also taken up by Dr. Reeve, of Dayton, who wrote a paper on mixed anæsthesia. The morphia should first be given by the hypodermic plan, and the anæsthetic subsequently; less of the chloroform will be required, and the danger of heart-failure will be reduced.

He had also been impressed with the statement that the condition of anæsthesia is a condition of danger. All the functions of life are suspended except circulation and respiration, and these are in a more or less damaged condition. Our attention, then, should not be directed to the search after new anæsthetic agents so much as in the direction of making those we have safer. He did not believe that ether is necessarily safer than chloroform. The agent that is used the most frequently would naturally yield a greater number of deaths, and when ether comes into more general use more deaths from it may be anticipated. If anæsthesia is a condition of danger, then the danger is present with ether as well as with chloroform.

In the treatment, he fully agreed with the statement of the inadvisability of giving alcohol in any form, especially hypodermically: as ether is a derivative of alcohol, and has the same effect as a respiratory paralyzer, it would only be adding fuel to the flame. Nor could he agree with the treatment by the injection of ammonia. Where there is danger of death from paralysis of respiration, there are two means of stimulation far superior to medicine: they are artificial respiration and faradism, which are far better in these cases than the so-called cardiac stimulant, atropia. If the cardiac ganglia are beginning to fail from exhaustion, the cardiac stimulant may meet with no response, or may prove injurious, for its first effect is that of stimulation; the second, exhaustion. The heart may be sustained by intravenous injection and artificial heat. He most decidedly protested against the subcutaneous injection of the tincture of digitalis. The action of digitalis is slow, and requires several hours to affect the heart. In a case reported by Boehm, death occurred five days after the administration of a poisonous dose of digitalis, from paralysis of the heart. Digitalis acts by stimulating the inhibitory apparatus, and not by giving increased power to the cardiac ganglia.

Dr. Huidekoper endorsed mixed anæsthesia.

Dr. Toboldt suggested nitrite of amyl in syncope after anæsthetics.

Dr. Henry H. Smith was present at the first administration of ether in this city. In 1846 he administered it for Prof. Horner, in the case of a woman whose breast was to be amputated: the patient was fully anæsthetized, to the great delight of the class. In spite of opposition and warnings of threatened litigation, they continued to use it at the clinic. The surgeons of Pennsylvania Hospital spoke very strongly against it, and one of the more prominent would not consent to be present where it was used. A leading obstetrician warned him that, as it was against the teachings of the Bible, it should not be used.

The first case reported by the lecturer was not a death from ether, but from shock. He recalled a case in which *brisement forcé* had been practised upon an anchylosed knee, without any anæsthetic, and the patient died twelve hours afterwards from shock. The state of anæsthesia is not without danger, but with proper precautions it is perfectly safe. The patient should not be smothered with a towel, but allowed to have fresh air. A bottle of ammonia should always be convenient, so as to allow the patient to inhale it if the breathing is imperfect. He had given ether for the last thirty years to cases in his clinic, and in

private practice, amounting to several thousand, without the slightest cause for anxiety. Even in cases of valvular disease of the heart, and in old age, he had used it without bad results. He insisted upon the importance of not allowing the patient to have any solid food on the day of operation, not since the evening previous.

He believed the danger to be greatly enhanced where mixtures are used. Physicians, moreover, should not be satisfied to use any anæsthetic without ascertaining its purity; the tests being easily applied. As he had no experience in the treatment of dangerous symptoms following anæsthetics, he would not discuss the subject, but said that he questioned the utility of hypodermic injections, and would prefer inversion of the patient, artificial respiration, and frictions of the skin.

Dr. Chas. B. Nancrede observed that in the popular estimation the danger from anæsthetics could not be very great, as they are generally intrusted to the youngest resident physicians in the hospital, and he had seen them thus given in the most reckless manner, so as to nearly strangle the patient. He was surprised that there were so few deaths.

One point not referred to was the effect of the ether upon the broncho-pulmonary mucous membrane. It is well known to act as an irritant, and to cause increased secretion. Under such circumstances, there is increased difficulty in forcing the blood through the capillaries, and the heart's action is reduced; this apparent weakening of the heart is not due to direct depressing action of the ether, but is caused by the difficulty in the capillary circulation. Artificial respiration will relieve this trouble.

As regards shock, he doubted if ether prevented it, as had been asserted. After a major operation he had seen great irregularity of the heart, due to the operation, and not the anæsthetic: if the patient had died, he would not have perished from the ether, but from the operation; he would be more likely to die without the ether.

In conclusion, he condemned the practice of pulling the tongue forward and holding it pulled out of the mouth, as this manœuvre by fixation of the larynx rather interfered with than assisted breathing; the method of pulling the jaw forward by placing the thumbs behind the angle on each side, on the other hand, greatly favors respiration.

Dr. O'Hara did not consider albuminuria as a contra-indication to anæsthesia, especially in cases of convulsions. The greater danger of chloroform over ether may be explained by its different specific gravity. The patient reported by Dr. Roberts may have had simply a weak heart; the absence of murmur is not conclusive evidence that the heart was healthy.

Dr. Albert H. Smith in obstetric practice preferred chloroform to ether, because it acted more promptly in relieving pains, but for prolonged operations he used ether and morphia, as recommended by Bernard.

Dr. John H. Packard referred to the use of nitrous oxide preliminary to the administration of the ether. He had not seen any ether deaths in healthy persons; they were all debilitated or reduced by chronic disease; among the chloroform deaths, however, some were included who appeared to be perfectly sound and healthy. Perhaps when ether has been given in as many cases as chloroform there will be just as great a mortality. In cases of death, the mere phrases "disorder of the heart," "diseases of the lungs," etc., are not sufficiently explicit; the profession wants to know what diseases of the heart, what was the condition of the lungs, as whether emphysema, chronic bronchitis, or the like. He had given ether in old drunkards with good results, and also in cases of albuminuria, which did well.

Secondary shock may follow operations after chloroform as well as after ether, and occurred before the introduction of anæsthetics.

In giving ether, no air should be admitted, but only ether vapor. If epileptiform convulsions occur, dash cold water in the face of the patient, and no bad results will ensue. The ether should be given on a towel folded into a cone, with only a small aperture at the top. In conclusion, he called attention to the similarity of the measures adopted in the treatment of Dr. Roberts's case and that occurring recently in Cincinnati.

Dr. A. G. Read believed that the very large amounts of brandy which had been thrown into the rectum and under the skin in the case just referred to were enough to cause a stoppage of respiration in a healthy person.

Dr. Chas. K. Mills called the attention of the Society to the recently-reported experiments of Brown-Séquard in producing general insensibility by dropping chloroform upon the skin. He thought it possible that in some of the cases of unfavorable effects in man the result might be explained by the local action of the chloroform.

Dr. Jos. Hearn, as anæsthetizer for the Jefferson Medical College, had given chloroform in many thousands of cases in the last eleven years, to young and old, without any bad effect. He advised giving the anæsthetic gradually, so as to accustom the patient to it; it may then be kept up for hours. Where much irritation is caused, it may be due to impure ether; chloroform does not cause such irritation. He always has a wet towel at hand to slap the patient's face as soon as he appears asphyxiated. He watches both the respiration and the circulation. He believed that the danger of chloroform upon the heart had been overrated. The use of morphia prior to operation is generally practised at Prof. Gross's clinic, as it requires less of the anæsthetic. The primary irritant effect of the

ether can be obviated by practising Dr. Bonwill's method of rapid respiration to obtund the sensibility of the mucous membrane.

When the chloroform or ether is carefully given, the danger is comparatively small; the risk is less in the agent than in the mode of administration. He had never seen a death from either chloroform or ether.

Dr. Roberts said that in the case he had reported the question as to whether death was due to shock or not was very appropriate, since the patient was much agitated and very anxious, because a very noisy sailor had been operated upon immediately before she was brought in, which had frightened her very much. Fatty embolism was also suggested as a cause of death; but there was no difficulty in respiration; for the same reason, artificial respiration was not required. The changes in the liver, kidney, and heart explained the fatal result, but they could not be ascertained previous to the autopsy. Ether gives trouble in these cases, perhaps, because so much is taken into the system, and the elimination is very imperfect; but he had reached the conclusion that ether is far safer than chloroform. Schiff and Dalton both use ether in preference to chloroform in their physiological experiments, because so many deaths are caused by the latter. Excluding deaths from mixed anæsthetics, the mortality from ether is comparatively small, since there have been reported only seventeen or eighteen cases in all. Nitrous oxide gas has been used preliminary to the ether with good results; and it has been recommended to give ether prior to chloroform administration. Mr. Dawson, of Leeds, England, was the first, he believed, to attribute the danger of suffocation from the increased secretions of the lungs to the coldness due to the ether in the bronchial tubes. The most recent authoritative statement in regard to anæsthetics was the Scientific Grants Committee of the British Medical Association, who declared chloroform to be the most dangerous, ethidene dichloride next, and ether the least. As matters stand at present, he would rather write upon a death-certificate "Death from ether" than "Death from chloroform."

REVIEWS AND BOOK NOTICES.

ERRATUM.

By a curious typographical blunder, the treatise on "Relapse of Typhoid" reviewed in our last number was attributed to *Dr. J. Pearson*, whereas the author was the late *Dr. J. Pearson Irvine.*

LECTURES ON DISEASES OF THE NERVOUS SYSTEM, ESPECIALLY IN WOMEN. By S. WEIR MITCHELL, M.D. Philadelphia, Henry C. Lea's Son & Co., 1881.

On rising from the rapt perusal of this brochure of some two hundred and twenty-five pages, the exclamation which jumped from involuntarily-moving lips was, "A most extraordinary book, upon an extraordinary subject, by an extraordinary man." The title of the book seems to us a misnomer, and unfortunate,—unless it is part of the rhetorical skill of its author to use a title-page as the server of dinners does a dish-cover, *i.e.*, to hide the good things within. There are thirteen chapters in all, and the monotone which runs through the whole wild chorus of nervous perturbations chaotic is hysteria. The volume might well have been called "lectures upon the hysterical demon in his strangest performances."

It is written in the author's supremely happy style, and is a record of a number of very remarkable cases, with acute analyses and discussions, clinical, physiological, and therapeutical. It is a book to which the physician meeting with a new hysterical experience, or in doubt whether his new experience is hysterical, may well turn with a well-grounded hope of finding a parallelism: it will be a new experience, indeed, if no similar one is here recorded. Possibly the most useful portions of the volume are those detailing the management of individual cases. The means adopted and the reasons therefor are so well given that most practitioners will, we opine, be able to learn and apply with great benefit to patients.

Of course there is much temptation to review such a fresh book as this at length, but—During the last war confiscated liquors were sent to the Medical Museum to be converted into alcohol for preserving purposes, and it was woful to see the little quantum of bright liquid that came from the worm into whose capacious still the dozens of champagne had been so grudgingly thrown. Something like this would happen were we to attempt to abstract the present volume. It does not treat of the hard science of the profession to be densely formulated in a few words, but it is a sparkling clinical discussion of a very rich experience, and as such has a value not to be melted out of it.

COMPENDIUM OF MICROSCOPICAL TECHNOLOGY. A Guide to Physicians and Students in the Use of the Microscope and in the Preparation of Histological and Pathological Specimens. By CARL SEILER, M.D., Late Director of the Microscopical and Biological Section of the Academy of Natural Sciences of Philadelphia, Curator of the Pathological Society, Pathologist and Microscopist to the Presbyterian Hospital, etc., etc. Pp. 130. Philadelphia, D. G. Brinton, 1881.

The author has not given us what his preface leads us to expect,—viz., "a comprehensive treatise on the subject." The matter found in his pages is very good, although it falls short of being complete. Written instructions without demonstration probably will never lead to success in mounting microscopic

specimens, and, whilst the methods here recommended are excellent in themselves, each one is not sufficiently described, nor are they varied enough to form a guide to students.

There are many—too many—incomplete manuals like the present one in existence, and it is only the production of an especially good one that can give excuse for presenting another to the public. The hand-book that is wanted in this department of work is one in which the methods applicable to every organ and tissue in their normal as well as their varied pathological states are thoroughly given. The microscope is one and invariable, and has been described over and over again; microtomes and knives are bought of the dealers, and scarcely any one, and especially not a beginner, makes his own reagents. All these things should be omitted. The coming new book on this subject should tell how to handle every specimen from the time it is taken from the body until it is on the microscope ready for examination. The causes of errors in manipulation should be as clearly stated as the method of procedure. We know of no one more capable than the author, with his ample experience, of giving us such a book.

The letter-press and illustrations are good. We note some *unusually* spelled and incorrectly used words. The book is more than worth its price to microscopists, in order to become familiar with Dr. Seiler's mode of work, which has won for him so good a name as a *préparateur*. M. L.

DISEASES OF CHILDREN. By WILLIAM HENRY DAY, M.D. Second Edition. Philadelphia, Presley Blakiston, 1881.

A careful examination of this book leads us to characterize it as a plain, straightforward treatise upon the subject of which it treats, well written (except in some rare places), giving sound practical advice, and capable of fulfilling its mission in the world. On the other hand, it seems to us to contain nothing very novel, either in fact or in the statement of the fact; so that it will not supersede the older treatises, but perhaps divide the markets with them. We have only one fault to find, —namely, that modern therapeutics are not in all cases fairly represented. As examples: no mention is made of the great value of jaborandi in the treatment of acute Bright's diseases; and on page 332, where the treatment of true croup is being discussed, we read, "Tartrated antimony is our sheet-anchor as a medicinal agent, from its certainty in effecting free and speedy vomiting." Few of our readers, we judge, but what would agree with us in thinking this very bad practice. Alum, sulphate of zinc, etc., not the horribly depressing antimony, act best,—at least, on this side of the Atlantic. The book contains about seven hundred and fifty pages of large, clear type, printed on paper of a moderate grade.

GLEANINGS FROM EXCHANGES.

BENZOATE OF SODIUM IN THE TREATMENT OF ACUTE RHEUMATISM.—Dr. David MacEwen (*Brit. Med. Jour.*, vol. i., 1881, p. 336), observing that benzoic acid is closely similar to salicylic acid in chemical composition, and somewhat the same in physiological effects, endeavored to determine whether it, like the latter, possesses anti-rheumatic properties. He publishes notes of five cases in which the remedy was employed in the form of benzoate of sodium. On the first occasion in which he used it, the relief of pain and subsidence of fever were so immediate, and the recovery was so rapid and complete, that he had no hesitation in adopting the same treatment in subsequent cases. The dose was, in the earlier cases, fifteen grains of the salt every three hours; in the later cases, twenty grains every two hours. In all the cases the symptoms passed off in periods varying from three days to a week after the commencement of the medicine; in none did cardiac complications arise in the course of treatment, and Dr. MacEwen thinks the convalescence was more rapid than in cases he had seen treated with salicylate of sodium. Benzoate of sodium possesses this advantage, that it does not give rise to the nausea and depression or the unpleasant head-phenomena which the salicylate frequently produces. It is most conveniently prescribed in the form of a mixture, and it may be given in doses of fifteen to twenty grains every two or three hours. It should also be continued in diminished doses for twenty-four to forty-eight hours after the rheumatic symptoms have disappeared.

SALICYLATE OF CINCHONIDIA.—Dr. Prosser James (*Brit. Med. Jour.*, vol. i., 1881, p. 428) urges the use of this salt as a very useful tonic and antiperiodic in neuralgia, rheumatism, sciatica, etc. In such cases five grains may be given every two hours, or ten grains may be given at once, and afterwards three or four doses of five grains at intervals of two or three hours. This salicylate is cheaper than that of quinia, and can be procured without difficulty in this country. According to Dr. James, it is incompatible with iron. It is rather insoluble, and therefore the bitter taste is not quickly perceived; it may be given as a powder in wafer-paper or in a pill, or it may be suspended in a liquid, though this is not an agreeable method of taking it. Dr. James prefers to give the remedy in compressed tablets. A patient who suffered acutely with neuralgia of the fifth nerve, which had twice been arrested by gelseminum, took for the third attack two tablets (five grains each?—ED.), repeating the dose in an hour: this sufficed. Dr. James has also used the remedy in pleurodynia and in the pains of chronic rheumatism. He has not yet tried it in acute rheumatism, but thinks that the substitution of salicylate of quinia

(or cinchonidia) instead of the salt of soda would be an advantage. In chronic cases of neuralgia and rheumatism, and in malaria, the salt will also probably be found useful. As a tonic and stimulant to appetite it may be given for a longer period in doses of two to five grains thrice daily.

THE PROPAGATION OF SYPHILIS BY RAZORS.—M. Desprès (*Brit. Med. Jour.*; from *Jour. des Connaissances Méd.*, Dec. 2, 1880) has lately published two cases in which syphilis appeared to have been communicated through the medium of the razor during the process of shaving. In the first case, a man, aged 54, of steady habits, and with no history of venereal disease, was shaved by a barber on July 11, 1880. The man observed, after being shaved, that he had three small cuts on the chin. On July 25 the patient (who had had no relations with women for ten weeks) noticed a swelling at the site of each of the cuts first noticed after the shaving. On September 1 the patient came under the care of M. Desprès, having been sent to that surgeon as a case of epithelioma. On examination there were found three ulcers on the chin, surrounded by some red and moderately hard callosities. There was a hard gland beneath the jaw, but none elsewhere. No other signs of syphilis were discovered at that time. On September 15 a papular syphiloderm appeared. The second case, that of a young man, aged 22, was in many respects similar to the preceding. In him also the initial lesion appeared on the chin, but the patient did not remember having been cut by the razor. In due time glandular enlargement and a general syphiloderm appeared.

A NEW METHOD OF APPLYING NITRIC ACID AS A CAUSTIC.—Dr. Speirs (*Practitioner*, April, 1881), having occasion to destroy a nævus the size of a hazel-nut, situated on the left cheek, under and encroaching on the lower eyelid in an infant, employed nitric acid by the following method:

Taking a two-ounce wide-mouthed vial, he broke off the body close to the neck, inverted the latter over the nævus, pressing the rim of glass firmly down upon the skin. This had the effect of forcing the tumor well up into the neck of the vial; and when the acid was applied by means of a pipette, it acted freely upon the whole surface of the nævus. Before removing the vial-neck, Dr. Speirs carefully mopped out all excess of acid with some cotton-wool on a probe. He then had the satisfaction of seeing a well-defined, circular slough, rather depressed, but with clean-cut edges, as if a punch had been used. The child suffered very little pain, and was easily pacified by being put to the breast. The action of the acid was found to have been entirely confined to the tumor, which was completely obliterated. No cicatricial contraction of the eyelid ensued, and the operation was completely successful.

URIC ACID AND GOUT.—Austin Meldon (*Brit. Med. Jour.*, vol. i., 1881, p. 446) maintains the following theses: 1. The presence of uric acid in the blood is not the sole cause of gout. 2. Want of exercise and of animal diet will produce an accumulation of uric acid in the blood. 3. Uric acid and soda must exist in the blood before the disease can be produced. 4. There must be depression of the nervous system to cause an attack of gout. 5. Depression of the nervous system causes a union between uric acid and soda, forming urate of soda. 6. When an attack of gout has passed away it does not necessarily follow that the uric acid has disappeared from the blood. 7. Uric acid may exist in the blood in considerable quantities and for any length of time without causing gout. 8. The use of nerve-tonics, as quinine, strychnia, and caffeine, and such like, as well as the inhaling of oxygen and the use of electricity, are of much service in the treatment of the disease.

TUPELO TENTS FOR DILATING THE UTERUS.—Dr. Landau (*Med. Times and Gaz.*, vol. i., 1881, p. 327; from *Volkmann's Samml. Klin. Vorträg.*), in a lecture on methods of dilating the cervix uteri, strongly recommends the tupelo tent, made from the root and stem of the *Nyssa aquatica*. He says these tents expand more uniformly than laminaria tents, and their coefficient of expansion is somewhat greater than that of any other tent. In expanding they produce the same softening and infiltration of the uterine tissues as other tents. They do not tend to septic infection; and therefore antiseptic precautions need not be rigidly carried out where they are used. One tent may be kept in three or four hours, and then replaced by another. The cavity of the uterus may thus be made accessible to the finger within twenty-four hours. In two years' use, Dr. Landau has seen no ill effects from their employment.

TREATMENT OF LEUCORRHŒA IN CHILDREN.—Leucorrhœa in children, says M. Bouchut (*Practitioner*; from *Le Praticien*), is caused by vulvitis, not vaginitis or metritis. He therefore treats this condition by extreme cleanliness, repeated bathing with bran-water and lead-water, lotions of corrosive sublimate (two grains to ten ounces of water), carbolic acid (two grains to the ounce), and occasionally solution of nitrate of silver (three grains to the ounce). In the intervals of applying the lotions a pledget of lint saturated with coal-tar or an ointment of red precipitate may be placed between the labia. Such a pledget kept in place by a pad protects the surrounding parts as well as the labia themselves from the irritating secretion, which is often present in considerable quantities. For the general treatment M. Bouchut recommends the administration of cod-liver oil and quinine to strumous patients, and of arsenic to those with eczematous eruptions.

LEAD-POISONING FROM THE USE OF COSMETICS.—At the recent meeting of the Kentucky State Medical Society (*New York Med. Record*, vol. i., 1881, p. 525) Dr. Holland called attention to the fact that there are certain distinctive, though rather vague, symptoms of lead-poisoning which precede the more marked symptoms of wrist-drop, colic, and lead-line, and which, when more carefully studied, would suffice to lead to an earlier diagnosis. These symptoms he described as headache, vertigo, slight colicky pains, and constipation. He then gave notes of the case of a woman who, two years ago, began the use of flake-white powder as a cosmetic. After exhibiting the symptoms already mentioned, she had an attack of melancholia of a month's duration; afterwards, the signs of plumbism—double wrist-drop and the blue line on the gums—were abruptly presented. He related in detail several similar cases illustrating the essential points deduced from the paper,—that lead may be introduced into the system to the extent of its toxic effects when applied on the skin in the form of powder and lotions; that the most popular beautifying cosmetics contain lead. The results of the chemical analysis of various popular cosmetics were given in detail.

SYPHILIS AND LOCOMOTOR ATAXIA.—In a recent number of the *Centralblatt für Med. Wissen.* (*Lancet*, vol. i., 1881, p. 592) Erb has published an additional series of facts confirmatory of those previously brought forward by himself as well as those of Dr. Gowers. Of one hundred consecutive cases of tabes, only twelve gave no history of a chancre or of secondary symptoms. The interval between the primary sore and the first symptoms of the ataxia was ascertained in eighty-eight cases; it was between three and five years in seventeen cases, between six and ten years in thirty-seven cases, between eleven and twenty years in twenty-four cases, and more than twenty years in ten cases. In order to ascertain the truth of the objection that the large percentage of cases of ataxia with preceding venereal sores or of constitutional syphilis is due simply to the commonness of the latter, Erb has investigated the history of four hundred individuals over twenty-five years of age, who were under treatment for diseases which were not suspected to have any relation to syphilis. Only twenty-three per cent. of these gave a history of syphilis, while the percentage of ataxic individuals giving a history of syphilis was eighty-eight! Erb thinks this justifies the conclusion that there must be an etiological connection between syphilis and locomotor ataxia.

SOME NEW USES OF SALICYLIC ACID.—Dr. George Kemp (*Brit. Med. Jour.*, vol. i., 1881, p. 510) says that salicylic acid may be used beneficially as a counter-irritant in superficial rheumatism. Thirty grains of the acid in an ounce of any suitable unguent has been found to alleviate local pain to a remarkable degree. Its advantage is greatly enhanced by the addition of iodide of potassium in an equal quantity. Another use of the remedy is in the form of enema. A case of obstinate dyspepsia with fermentation, only relieved by emetics, and accompanied by constipation and scybala, was treated by enema, with thirty grains of salicylic acid and half an ounce of tartrate of potash dissolved in a pint and a half of lukewarm water. The result was remarkable; the colon was not only relieved of its scybala, but its tonicity was greatly restored, suitable general treatment being resorted to at the same time.

VARIOUS FORMS OF IRON SUITABLE IN THE ANÆMIA OF CHILDREN.—Dr. Jacobi (*New York Med. Record*, 1881, p. 76) recommends in the anæmia of children the lactate (adult dose 1 to 2 grains, soluble in 48 parts water), the tincture of the malate, the tincture of the chloride, the pyro-phosphate (adult dose 2 to 5 grains, soluble in 1 to 2 parts water), and the subcarbonate (dose 5 grains and upwards, insoluble). The syrup of the iodide is called for when an absorbent is wanted. The subcarbonate, combined with three times its weight of subcarbonate of bismuth, and three or four times its weight of bicarbonate of sodium, is especially beneficial when gastric catarrh interferes with general improvement during slow convalescence or progressive anæmia. The tincture of the chloride must be regarded as a vascular irritant; it is the most beneficial preparation where the action of the heart is lowered and blood-pressure is lacking.

MR. SPENCER WELLS'S THOUSANDTH OVARIOTOMY.—At a recent meeting of the Royal Medical and Chirurgical Society (*Lancet*, vol. i., 1881, p. 332) Mr. T. Spencer Wells read a paper on "Two Hundred Additional Cases, completing One Thousand Cases of Ovariotomy, with Remarks on Recent Improvements in the Operation." The mortality of the ninth series was 17; of the tenth, 11. Among the 1000 cases, 231 had died and 769 recovered; but the mortality had steadily diminished from 34 in the first hundred to 11 in the last. Since the 888th case all the operations have been in private practice, and all have been done antiseptically, the result being a mortality of 10.6. Mr. Wells discussed the question how far this lessened mortality was due to antiseptic precautions or to other recent improvements in the mode of operating, describing in detail various modifications in each step of the operation.

NATURAL HISTORY OF LEUCODERMA.—Mr. Squire (*Brit. Med. Jour.*, vol. i., 1881, p. 499) gives the case of a patient in whom vitiligo appeared on the backs of the hands at the age of 38, and disappeared again at the end of six years. The course of this disease is rarely recorded.

THE TREATMENT OF SOFT FATTY TUMORS.—Dr. Schwalbe, at the recent congress of German surgeons (*New York Med. Rec.*, vol. i., 1881, p. 528) described a method of treating telangiectases, soft fatty tumors, and even small herniæ, by the injection of a fifteen- to twenty-per-cent. solution of alcohol. By these injections—which in most cases he repeats perhaps twice a week, and for a prolonged period if necessary—he has secured some excellent results. An extensive telangiectasis of the face which had resisted treatment by the Paquelin cautery had been treated by successive alcohol injections, securing a gradual shrinkage and almost entire disappearance of the tumor.

AN OLD TREATMENT OF DYSENTERY REVIVED.—Mr. Henry Colley March (*Med. Times and Gaz.*, vol. i., 1881, p. 319) says that in the ordinary dysentery of adults with some fever, much griping, constant attempts at stool, with tenesmus, the evacuations consisting of bloody and shreddy mucus, without any proper fecal matter, the proper procedure is to give every half-hour half a minum of the liquor hydrargyri bichloridi (B. P.). The first dose will sometimes relieve the pain; in a few hours the tenesmus ceases, and on the second or third day healthy stools make their appearance. Mr. March looks upon the remedy as the perfection of medication as a specific tonic.

ACUTE ARTICULAR RHEUMATISM OCCURRING IN A CHILD NINE MONTHS OF AGE.—Rheumatism is so rare in the earlier years of life as to be hardly even mentioned by such writers as West and Vogel. Dr. Garden gives (*Practitioner*, March, 1881) the case of an infant of nine months who caught cold from bathing in cold water. Rheumatism followed, affecting the knee- and ankle-joints. These were wrapped in cotton and three grains of salicin thrice daily were prescribed. The patient recovered in a fortnight without showing any signs of heart-complication.

CHRYSOPHANIC ACID IN PSORIASIS.—A correspondent of the *Lancet* (vol. i., 1881, p. 524) says that Prof. Charteris has described in his lectures some cases in which it was very evident that chrysophanic acid acted constitutionally as well as locally. In one very severe case, he, having previously very carefully wrapped up the arm and leg of one side in cotton-wool, applied chrysophanic acid (one drachm to an ounce) to the leg of the opposite side. In ten days the cure was complete, and on removing the cotton-wool from the other side it also was found to be quite cured of the psoriasis. This shows that the drug acts constitutionally as well as locally (?—ED.).

PALATABLE COD-LIVER OIL.—Mr. Fairthorne, the well-known pharmaceutist of West Philadelphia, suggests (*Pharmaceutical Journal*) a new method of administering cod-liver oil, which consists in adding two drachms of tomato- or walnut-catsup to each ounce of the oil, the mixture being shaken before taken. Mr. Fairthorne also states that the following mixture is readily taken by the patient: Liebig's extract, one-half ounce; extract of celery-seed, half a fluidrachm; vinegar, one fluidounce; water, two fluidounces; cod-liver oil, five ounces. The extract of beef is dissolved in the water, the vinegar and oil are added, and the whole shaken with the extract of celery.

ALOPECIA FROM NERVOUS SHOCK.—Dr. Thomas H. Kinney (*Virginia Med. Monthly*, 1881, p. 937) gives the case of a man of 35, who was driving along the road in his cart one day last summer when the lightning struck a tree very near him. His mule was knocked down, and he himself was rendered insensible. He thought he was unconscious twenty or thirty minutes. With the exception of a dazed feeling about the head, which lasted for twenty-four hours, his health was apparently unaffected.

Six or eight days after the shock, the hair on the scalp, face, axillæ, genitals, etc., began to come out, and in a few days he was as hairless and smooth-skinned as an onion.

The after-history of the case is not given.

DESTRUCTION OF TRICHINÆ.—Recent investigations of Dr. Vacher, of Paris, go to show that boiling does not necessarily render trichinosed meat innocuous. He took a leg of pork of moderate size and boiled it thoroughly. A thermometer placed within it at a depth of two inches and a half registered, after half an hour's boiling, 86° Fahr., after boiling for an hour 118°, after an hour and a half 149°, and after two hours and a half, when the joint was thoroughly cooked, 165°. This temperature, M. Vacher maintains, is insufficient to kill the encapsuled trichinæ.

IN ANOREXIA.—M. Huchard recommends the following stomachic for persons who suffer from debility with loss of appetite:

℞ Tinct. cardamomi comp., ʒi;
Tinct. anisi, ʒi;
Tinct. aurantii corticis,
Tinct. gentianæ,
Aquæ menth. pip., āā, ʒiiss;
Aquæ ad ʒi. M.

Sig.—Teaspoonful between meals.

FORTUNATE PROGRESS OF PROFESSOR BILLROTH'S CASE OF EXCISION OF THE PYLORUS.—Professor Billroth's famous case of excision of the pylorus with part of the small intestine lately reported continues to make good progress. The patient has been able to take not only a milk diet, but also, lately, white meats, and has lately left the hospital convalescent.

DR. JACOBI says that strychnia in his hands has proved a valuable adjuvant to iron or arsenic in the treatment of the anæmia of children. To a child two years old it may be given with safety in doses of one-fortieth of a grain daily (in three doses?—ED.), and continued for a long time.

COD-LIVER OIL AND IODOFORM.—Dr. Fonssagrives (*Med. Times and Gaz.*, vol. i., 1881, p. 377; from *Union Méd.*) recommends the following formula: Pale cod-liver oil, 3 ounces; iodoform, 4 grains; essence of anise, 4 drops. The addition of the iodoform and anise masks greatly the taste and smell of the oil, while in every tablespoonful there is one-sixth of a grain of metallic iodine. Persons taking the ordinary cod-liver oil should add a small quantity of table-salt, which greatly modifies its unpleasant taste and facilitates digestion.

MISCELLANY.

CAN A MAN GRADUATE WITHOUT SEEING A CASE?—In New York, apparently, he can. Dr. R. F. Weir, in a letter to the *New York Medical Record*, says that he can say, from personal knowledge, that "a student may graduate without ever having dissected any part of the human body, without ever witnessing or attending a midwifery case, or without ever being present at a hospital clinic." It is also possible for a student "to graduate in less than a year from the beginning of his actual study."

FATAL RESULT OF APPLICATIONS OF PERCHLORIDE OF IRON BY A PHARMACEUTIST.—At a recent meeting of the Anatomical Society of Paris, Dr. Galliard related the case of a man suffering from epistaxis who had been cared for by a druggist. The druggist had tamponned the nasal passages repeatedly during several days with perchloride of iron solution. Death supervened, and at the autopsy gangrenous inflammation of the upper air-passages was observed, with iron-stains, extending through the cribriform plate of the ethmoid to the arachnoid membrane.

REMARKABLE CASE OF EARLY MATERNITY.—Mr. Henry Dodd, of Rillington, York, gives (*Lancet*, vol. i., 1881, p. 601) the account of a joiner's wife delivered, August 8, 1871, of a female child who began to menstruate at twelve months, at first irregularly, but after the seventh year regularly every three weeks. The child ceased to menstruate on June 22, 1880, having been impregnated when eight years and ten months old, and was delivered, at full term, of a child weighing seven pounds. There was nothing remarkable about the appearance of the child, but the hirsute growth over the pubes and in the axillæ was profuse, the breasts large and, at the time of report, gorged with milk.

NEW EXPERIMENTS IN THE ARTIFICIAL PRODUCTION OF TUBERCULOSIS.—M. Hippolite Martin has presented to the Biological Society of Paris specimens of artificially-excited tuberculosis in rabbits resulting from the injection of apparently inert powders (lycopodium, etc.) into the peritoneal cavity.

THE Northern Medical Society of this city has elected two women physicians to the honors of membership.

OFFICIAL LIST

OF CHANGES OF STATIONS AND DUTIES OF OFFICERS OF THE MEDICAL DEPARTMENT U.S. ARMY FROM MAY 15 TO MAY 28, 1881.

KEENEY, C. C., LIEUTENANT-COLONEL AND SURGEON.—When relieved by Surgeon Baily, to await orders at San Francisco, Cal. S. O. 112, c. s., A. G. O.

BAILY, E. I., LIEUTENANT-COLONEL AND SURGEON.—To report in person to the Commanding General, Military Division of the Pacific and Department of California, for assignment to duty as Medical Director of the Department of California, relieving Surgeon Keeney. S. O. 112, A. G. O., May 16, 1881.

MCPARLIN, T. A., LIEUTENANT-COLONEL AND ASSISTANT MEDICAL PURVEYOR.—When relieved by Surgeon Clements, to proceed to San Francisco, Cal., and assume charge of the Medical Purveying Department in that city, relieving Captain Henry Johnson, Medical Storekeeper. S. O. 112, c. s., A. G. O.

CLEMENTS, B. A., MAJOR AND SURGEON.—To be relieved from duty at Willet's Point, N.Y., June 1, 1881, to proceed to New York City, and assume the duties of Attending Surgeon there, relieving Lieutenant-Colonel McParlin. S. O. 112, c. s., A. G. O.

BACHE, D., MAJOR AND SURGEON.—His leave for one month on account of sickness extended one month. S. O. 79, Division of the Pacific and Department of California, May 17, 1881.

BILLINGS, J. S., MAJOR AND SURGEON.—To proceed to London, England, as a delegate to the International Medical Congress to meet there August next. He will also visit, on public service, such points in Holland, Belgium, Germany, and elsewhere, as may be deemed necessary by the Surgeon-General of the army. S. O. 110, A. G. O., May 13, 1881.

TREMAINE, W. S., CAPTAIN AND ASSISTANT-SURGEON.—His leave of absence on account of sickness, granted him January 20, 1880, from this office, further extended six months on Surgeon's certificate of disability. S. O. 112, A. G. O., May 16, 1881.

MEACHAM, F., CAPTAIN AND ASSISTANT-SURGEON.—Relieved from duty at Fort Hamilton, and assigned to duty as Post-Surgeon, Fort Wadsworth, New York Harbor, relieving Assistant-Surgeon Burton. S. O. 90, Department of the East, May 20, 1881.

PATZKI, J. H., CAPTAIN AND ASSISTANT-SURGEON.—When relieved by Assistant-Surgeon Cuningham, to proceed to St. Augustine, Fla., and relieve Assistant-Surgeon Gardner from duty as Post-Surgeon. S. O. 45, c. s., Department of the South.

WOODRUFF, E., CAPTAIN AND ASSISTANT-SURGEON (now awaiting orders in New York City).—To report to Commanding Officer, Willet's Point, N.Y., to relieve Surgeon Clements. S. O. 116, A. G. O., May 21, 1881.

WORTHINGTON, J. C., CAPTAIN AND ASSISTANT-SURGEON.—Assigned to duty at Fort Wayne, Mich. S. O. 86, Department of the East, May 14, 1881.

SHANNON, WILLIAM C., CAPTAIN AND ASSISTANT-SURGEON.—Assigned to duty at Fort D. A. Russell, Wyoming. S. O. 44, Department of the Platte, May 21, 1881.

CUNINGHAM, T. A., FIRST-LIEUTENANT AND ASSISTANT-SURGEON.—Assigned to duty at Jackson Barracks, La. S. O. 45, Department of the South, May 14, 1881.

BURTON, H. G., FIRST-LIEUTENANT AND ASSISTANT-SURGEON.—Assigned to temporary duty at Fort Hamilton, New York Harbor. S. O. 90, Department of the East, May 20, 1881.

BRECHEMIN, L., FIRST-LIEUTENANT AND ASSISTANT-SURGEON.—Relieved from duty at Fort Meade, D.T., and assigned to duty at Fort Yates, D.T. S. O. 84, Department of Dakota, May 10, 1881.